MOTHER TONGUE

JOURNAL OF THE ASSOCIATION FOR THE STUDY OF LANGUAGE IN PREHISTORY

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MOTHER TONGUE **Issue XIV, 2009**

Journal of the Association for the Study of Language in Prehistory

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MOTHER TONGUE
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Professor Daniel F. McCall

By Harold C. Fleming

> *It is very painful to report such an unhappy thing but my dearest colleague in Anthropology and one of my very best personal friends has left us, has died. Dan was with us from the beginning of the Long Range Comparison Club, the precursor of ASLIP. He never left us and supported our efforts all the way. The following formal obituary cannot convey the deprivation we feel –family and friends –from the loss of this wonderful man, one of the few I could talk to about the whole range of our interests, and ASLIP's too. I wish I could see him again!*

Emeritus Professor of Anthropology at Boston University, Daniel McCall died at his Boston home on July 10, 2009 after a prolonged illness. Beloved of students and colleagues during his more than thirty years of teaching at Boston University, he also contributed seriously to the development of historical approaches in anthropology, besides living an interesting, indeed memorable life before joining academia.

Borrowing from his own published memoirs, we learn that he was born in March 1918 in Westfield, Massachusetts and that his mother died not long after his birth. About that time his father's shoe store was defeated by the surging McCann shoe company, thus unemploying his father and forcing Dan into a Catholic orphanage. During his residence in the orphanage during the 1920s Dan ran away to join his father no less than six times. During his later childhood a nun told him not to read a particular book and not to read books from the public library because they were sinful. That was too much for Dan who valued the public library more than his religion. So he elected to quit being a Catholic and moved in permanently with his father.

But these incidents also marked him as a free thinker, a desirable precondition for an anthropologist, but also moved him in the direction of a critic of the society he was brought up in, another attribute of a fledgling anthropologist but not necessarily a good one. At the end Dan was a virtual socialist, at least in thinking but not in memberships.

Graduating from high school in the mid 1930s in the depths of the Great Depression, he took the nomadic option and "rode the rails" around the country eventually working on vegetable farms in Arkansas and elsewhere. This interesting period of about four years between high school and the Great War was a very important one for Dan. Not only a voluminous reader throughout his childhood and youth, he was also very curious about the actual world he lived in. Besides his work in agriculture and at roustabout jobs, he managed to get in a year or two of class work in small colleges which led to some diplomas. He worked at various jobs for the colleges in order to pay for the education.

About this time, since Dan was of a ripe age and the USA was gearing up to withstand the Axis powers, he was drafted. He chose the Coast Guard, partly because he had become a "pacifist"; that did not matter because shortly thereafter the Japanese took the USA into World War II and the US Navy quickly absorbed the Coast Guard. Dan joined the newly enhanced amphibious forces as a corpsman (medic) which saw him fighting the whole four years of the Pacific war, attacking beaches to be fired at but not to fire back, attending to the wounded and the dying, and somehow surviving! He not only survived three other beach assaults, including Saipan and Kwajalein, he ended up in the terrific battle for Okinawa where his Navy ships withstood the attacks of the suicidal *kamikaze* pilots, one of which just missed killing him. At another point his ship was torpedoed by the Japanese and had to be towed 4000 miles to Hawaii whilst having a gaping hole amidships!

A grateful nation gave Dan and other veterans the G.I. Bill, thus sending this avid reader to Boston University for his B.A. and to Columbia University for his PhD – in Anthropology, At that time Columbia had a leading department of Anthropology and Dan took courses with outstanding scholars such as A.L. Kroeber and Joseph Greenberg. The latter was in the midst of revolutionizing historical linguistics in Africa with a classification of its hundreds of languages into four major (genetic) families, a taxonomy which has withstood numerous savage attacks for half a century..

After his field work in Ghana, Dan joined Boston University in the 1950s and set out to establish a department of Anthropology to go along with the new African Studies program there. After he had been able to add some anthropologists to the Sociology department in the early 1960s, he prevailed upon the friendly sociologists to countenance a new Anthropology. The beginnings of its separation from Sociology began in 1965 with new hirings and by 1970 the divorce was final. It was also amicable.

With colleagues similarly interested Dan nurtured a new ethos in B.U.'s anthropology: historical approaches which culminated in the famous "*four fields*" approach, combining ethnology, historical linguistics, archeology, and biological anthropology (both fossils and human genetics). In the late 1960s and early 1970s this new historically oriented anthropology was gathering strength and heating up but was abruptly terminated by President Silber who wanted a "successful" department along more contemporary lines. Silber's arbitrary decision established a cantankerous and unhappy department lasting for twenty years. Eventually the archeologists tired of coping with quarrelsome ethnologists and broke away to form a new department of Archeology. Their move had clearly been approved by Silber's administration. Recently a happier department has emerged and much of Dan's vision has been restored. But without archeology, of course, it could never be the same as what Dan had dreamed of.

Dan's ideas attracted numerous graduate students, many of whom hold faculty positions now in various universities around the country. Dan also had tremendous loyalty to students. For example, in the 1970s when the faculty of Boston University had had enough of President Silber's hard-charging Texan style, a faculty union was born which soon entered into conflict with Silber and his administration. Finally, things came to a head and the faculty went out on strike, a very unusual event in New England and most of American academia. Feeling ran high on both sides. At that time Dan was asked to join in the strike but he refused --flatly. Why did not a liberal Democrat, if not an incipient socialist, join his good colleagues in the struggle against arrogant managers? Dan's answer was emphatic. He would not join a strike which would hurt the students. What a strike would cost the students outweighed the benefits a faculty member might gain!

What is unusual and pointed about this incident is that Dan had a history of defying authority figures. He was a very independent and spirited soul. Not only in his childhood resistance to the authoritarian nuns, not only during his travels around the country during the Great Depression, but also once in the Navy he defied a group of officers. That could have led to a Dishonorable Discharge and the loss of all his GI Bill of Rights benefits, including most seriously his free college education.

Once during his long tenure at Boston University he had to put up with a very bossy (read authoritarian here) chairman of his department –like the rest of us. One day when said chairman, actually a female, was abusing her colleagues, Dan lost his temper and overthrew the common table, scattering glasses and cups in all directions. Whereupon he muttered some thing about showing her whatever and stormed out of the room. People in authority did not suppress Dan for very long before he rebelled!

During the 1980s as Dan retired from his tenured position at Boston University some of his conception was incorporated into a new scientific organization. Dan was a founding member, frequent contributor to , and member of the Board of Directors of the Association for the Study of Language In Prehistory (ASLIP) and its publication , *Mother Tongue.*

When at Columbia University, Dan met the traditional field research requirement of graduate programs in Anthropology by doing his field work in West Africa, specifically Ghana and especially on the Ashanti people or Twi speakers. This led to a life long interest in both West Africa and in what was once called "primitive art". His own ability to sketch and draw was significant, greatly enhancing his classes on art and African history. One of his outstanding publications on these matters was *Africa In Time Perspective* which greatly influenced both his students and colleagues but also the whole field of African studies.

Dan's approach was rooted in anthropology which was not always appreciated by professional orthodox historians. Most standard or orthodox history is based on documents, beyond which orthodox historians are loathe to venture. Historical anthropology is not at all so limited, because it will take its data from fossils, cultural remains, ethnological inferences about the past, language relationships, reconstructed languages with specific contents, and of course the inferences from human genetics or anthropometry projected into the past. British social anthropologists who were unwilling to do such things were wont to call these historical approaches "conjectural history", "bogus history", and the like, forgetting perhaps how much of European history relied on historical linguistics, for example, for some of its conclusions.

But Dan realized that so much of Africa had a very late 'history' compared to the classical civilizations of the Near East. As his colleague put it, elsewhere:

" History in the narrow sense, or proper history in the British sense, relies on written documents (plus film and audio recordings in the modern period) and is said to have begun with Sumerian writing. However, the African perspective on proper history is different from a European or a Near Eastern one. First, African writing is almost as old as

Sumerian, having started in Egypt by 3300 B.C. by latest count. Second, African writing begins in northern Ethiopia in the last centuries before Christ, when Sabeans and other Semites crossed the Red Sea and left stone works bearing their writing. Third, it begins on the East African coast, mostly in sea ports where contacts with Arab and other Asians can be dated back almost to the time of Christ. Fourth, for most of the north African littoral and Maghreb, writings begin in the early first millennium before Christ, with the colonies of Phoenicians (later Carthaginians) and Greeks and later Romans. But, fifth, for most of Africa, and even southern Ethiopia, history is much later. For some on the West African coast, contacts with the Portuguese—and later with other west Europeans—began in the fifteenth century A.D. For others still more recently,,,,"[1]

Dan also was interested in old connections between Africa of the Sahel or sub-Saharan Africa and the north African littoral or Mediterranean Africa. Twice he crossed the Sahara Desert from Algeria to Nigeria or Niger, once by Volkswagen and once by native bus. He became an expert on trans-Saharan trade routes and historical contacts, especially between Greek, Carthaginian or Roman north Africa and sub-Saharan trading centers and kingdoms. Some of this research led to an interest in the origins and spread of chariots and charioteer warfare, leading eventually to an interest in the Indo-Europeans and their great success in chariot warfare. In fact nearly his last published work was a book review of David W. Anthony's *The Horse, The Wheel, and Language: How Bronze Age Riders from the Eurasian Steppes Shaped the Modern World*. Princeton University Press (2007) which was about the Indo-Europeans; it was published in *Mother Tongue*, Issue 12, 2007, pp.215-222.

His very last publication (at age 90!) was an article on the diffusion of the concept of the seven day week from ancient Babylon across the Saharan trade routes to the Akan cultures of the Guinea Coast of West Africa. That same diffusion had, of course, established the seven-day week in Europe. This was the first publication of this interesting and surprising hypothesis. It came out in J.D. Bengtson, ed., 2008, *In Hot Pursuit of Language in Prehistory: Essays in the four fields of anthropology*. Amsterdam: John Benjamins Publishing Company. Pp.25-36

It may also have something to do with the cultural fact that in much of western Europe the number 'seven, 7' is close to a sacred number or a lucky one, along with 'three, 3'. As Dan pointed out, sacred or lucky numbers vary from world region to world region. In West Africa, for example, the number 'four, 4' is the basis of the week. This may very well have to do with the frequency of market days in that region, rather than the notion of deity planets. In India the number 'five, 5' reigns supreme, with roots perhaps in religion.

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[1] H.C. Fleming, 2006. *Ongota: A Decisive Language in African Prehistory*. Especially Chapter One. This source should also have mentioned the writing begun in the Sahel, based on the Arabic script and usually called Ajami. It flourished in the 14th century AD but still survives in limited areas and is presently undergoing a renaissance.

Association for the Study of Language In Prehistory – 2009

The Annual Meeting of the Association for the Study of Language In Prehistory (ASLIP) was held on December 12, 2009 at the Department of Sanskrit and Indian Studies, Harvard University, 1 Bow Street, Cambridge, Mass., U.S.A.[1]

Herewith the results of the elections of officers. The following were elected to office for the year 2010:

Michael Witzel: President
John D. Bengtson: Vice President
Michael T. Lewis: Secretary-Treasurer
Murray Denofsky: Recording Secretary for Meetings
John D. Bengtson: Editor of MOTHER TONGUE

The meeting was also concerned, among other things, with the number of people who participate in discussions on MTLR[2] but are not dues-paying members of ASLIP. It's like a free lunch, huh? How about helping us out financially? Join us or send Michael Lewis some of your extra money.

President Michael Witzel announced the new and simplified URL for the ASLIP / MOTHER TONGUE website/homepage: http://www.aslip.org. Previously the homepage had been "piggybacked" on Professor Witzel's homepage with a very unwieldy URL.

Due to the passing of Dell Hymes and Daniel McCall, we also will have some openings for distinguished scholars on our Council of Fellows.[3] You may recall that George Starostin and Vladimir Dybo were elected last year. Members are free to nominate people for positions on the Council. Non-members are not entitled to make nominations or to vote. (Nominations should be sent to the Secretary-Treasurer.)

As of middle January 2010 Michael Lewis has taken over the duties of Secretary-Treasurer. Annual dues are US $35 or Euros 30. *Please do not send Euros in the form of checks* because our bank takes most of that for 'fees'. Contact Michael Lewis on how to submit dues payments from countries outside of the U.S.A.

(Contact information for officers is listed on the inside front cover of this issue.)

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[1] Thanks to Hal Fleming for providing the substance of this page, slightly modified by me [Ed.].
[2] The Mother Tongue – Long Ranger discussion site `MTLR@yahoogroups.com`.
[3] This is an honorary position, with no prescribed duties. Council nominees should have made significant contributions to the study of language in prehistory.

Remarkable New Research by Paleoanthropologists

Harold C. Fleming

This research is so important and so convincing that we have broken our old rule about 'color reproductions' which cost more to reproduce than standard black and white print pages. We here present several pages taken from the journal *SCIENCE* which clearly and succinctly sum up a host of important conclusions from recent research. In addition to reportage on the data and analyses thereof, as well as the further illumination of our common family tree, there are several key heuristic conclusions which are surely worth some small discussion.[1]

The source is one of the two top scientific journals in the world, *SCIENCE, October 2, 2009, volume 326.* Instead of citing pages, we will use the term 'passim' because the whole issue was dominated by a series of articles which together constituted a report. Collectively they are labeled ***'Special Section. ARDIPITHECUS RAMIDUS'*** which contains 11 articles from page 60 to 106; they are dense with data and analyses.

The authors are almost too numerous to mention, so we have included two pages with their pictures and academic addresses . It is predicted that our members will wish to get in touch with some of them because the 47 authors come from 9 countries, or 10 if California be considered as one in itself. Besides the probable dominance of Berkeley there are strong representations from Ethiopia, France and Japan. Intellectually or cognitively, there are clear leaders with Tim White and Owen Lovejoy predominant. One could call the whole effort Tim White's team and friends. They are to be saluted!

The data are almost amazingly clear, right down to the little fingers and big toes of Ms. Ardi and the host of finds of the little fauna and flora of Ardi's habitat. One example of what a linguist would consider meticulous data gathering is given when it is reported that to really find what is on the ground in front of them a team of five to fifteen field workers get down on their hands and knees and shoulder to shoulder (!) methodically cover a clearly defined patch of land – looking, looking! Then that is repeated again and again in the same plot until nothing more can be found. Wow!

Think back on the old image of the aristocratic archeologist sitting in a chair overseeing a group of laborers going at the site with pick axes. I would call the contrast technological change of the mental (psychosocial) sort.

Paleoanthropology has moved closer to the Natural Sciences in my lifetime, while archeology has basically followed them. The model here is not Physics or Chemistry, in my opinion, but rather the so-called Earth Sciences or the old Geology and Biology, especially Paleontology. There is constant talk of hypotheses and the testing of them. There are good-natured, even friendly, admissions of falsification of someone's hypothesis, even one's own, even if (one presumes) there may be cruel delight that your competitor's theory has gone down in flames. The atmosphere is polite, sometimes cordial, but also rational and cooperative. The arguments revolve around data, analyses, and hypotheses connected to them. Authority figures do not last long by insisting that they are right or that someone else is wrong for disagreeing with them. If authority cannot produce a good argument with clear empirical attributes, then its circle of admirers and hence its authority will quickly dwindle. You cannot dismiss someone's hypothesis by shouting it down *à la* Campbell and Goddard, unless it is patently silly and unscientific.[2]

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[1] It is understood that this paper will be 'old news' to some, since the package came out half a year ago. But for the many who do not subscribe to SCIENCE which is frightfully expensive and for those who only heard bits and pieces (or were titillated by the TV program) here is a chance to hear more of this fascinating research.

In any case the reporting on *Ardipithecus ramidus* is excellent from an ordinary scientific standpoint. There are multitudes of hypotheses to account for huge amounts of data and larger models (hypotheses) to account for them. And the prevailing attitude is "let's test that to see if it is true". I would awaken Karl Hempel to see this!

There is also an impressive searching of the literature to air other viewpoints or confront conflicting hypotheses or to aid in reconstructing the whole scene. Someone even bothered to get exact quotes from Darwin and Huxley to illustrate some points (with which they agreed). Naturally, when you have 40 colleagues, it is easier to search the literature and compile the bibliography.

What then are the main points and conclusions of this massive research? To some extent we will let the color reprints from *SCIENCE* do some of the reporting, but our own summary perhaps has value too if only because we use a different kind of English. There is *SCIENCE* style English; they use it usually. There is *NEW YORKER* style English which we tend towards. The former style can become insufferably impenetrable on occasion, while the latter can be accused of being "unscientific". The various sciences, as well as many professions, prefer their own vocabularies or jargons and some of their fellows can be down right haughty in challenging the credentials of those who use ordinary educated English. I can only say Vive le *New Yorker*! Let's get down to business.

The remarkable set of well-tested and clearly presented conclusions of the *Ardipithecus ramidus* report are, as follows:

1) Geneticists have convinced us that *Pan troglodytus* and *Pan paniscus* are the closest relatives of humanity, the *Hominidae*. In other words we accept the conclusion that chimpanzees and bonobos are our next of kin. Gorillas are the next closest.

2) *Pongo* or orangutan is the outlier or most remote of the great apes, living only in Southeast Asia. They have nothing to say about the *Hylobate*s (gibbons), the next further out.

3) *Pongo* is probably derived from the period of 18 million years ago (18 Ma) when African apes crossed over into Eurasia after the African plate plowed into Arabia, and thence Asia. (They used the marvelous expression "docked onto Asia".) A number of fossil apes in South Asia, like *Sivapithecus, et al* are related to the *Pongo* line., although not necessarily directly ancestral. This may in fact be the first of the great 'Out of Africa' movements which concluded with *Homo sapiens* migrating along the same route.

4) The separation of *Gorilla* from *Pan* and *Homo* began in the Miocene (24 Ma to 5 Ma) and marks the GLCA (Gorilla/Human Last Common Ancestor) or what linguists might call proto-Gorilla-Human. Theoretically there could have been a stage which we might call proto-

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[2] Our friend, John DiCara, in Texas believes that is what has happened to the theory of 'crop circles' in England and elsewhere. Some scientists and many laymen were quick to dismiss the phenomena abruptly because it reminded them of flying saucers and nutty people who were stolen away by aliens from outer space. In fact, John argues, there was considerable empirical evidence to support the crop circles as phenomena but not necessarily all the silly theories advanced to explain them. A point well taken.

African Ape before that. Finally a stage which did not occur in Africa, not necessarily, which would be HPLCA (Hylobates-Pongo/Human Last Common Ancestor). This resembles the reasoning in language distribution studies, the greatest phyletic (cladistic) differences suggest the homeland better than demography or diversity measured in numbers. Gibbons (H) are the most remote taxonomically, orangutans (P) are the next , then us African apes. H and P argue that ultimately we apes are Asians, not Africans. (This heresy is not, of course, mentioned in the team's report!) To be fair, however, we must look at the distribution of our next closest relatives after gibbons, namely, the Old World Monkeys, or *Cercopithecidae*. Of their 11 genera at least 8 are focused on Africa. Furthermore the distributions of the rest of the Primate Order do not overrule the likelihood that Africa has been the primary continent for evolution leading to *Homo sapiens*.

5) The time of CLCA –the chimpanzee-human split –has led to significant differences among scientific estimates. Sometimes as early as 10 Ma to 15 Ma or as recently as 6 Ma. Our team reckons that the geneticists' dates are wrong and figure that 6-10 Ma is most likely. Note that this is the first of several times we will mention fossil students not accepting DNA dating. More on this much later.

6) The physical structure of chimp-man (in CLCA) was **not** that of modern African apes, either gorillas or chimpanzees or bonobos. It has been assumed for many generations now that very early man was predominantly ape-like, rather than being human-like. Logically, they could have reasoned that the ancestors of the chimpanzees must have been much more like humans, since humans were their closest relatives. But the heritage of the 19th century, it seems to me, was alarm or fear that humans were descended from apes. So naturally our common ancestor must have looked more ape-like than human, if he wasn't simply a chimpanzee. Darwin and Huxley could have used our team's conclusion in their day!

7) *Ardipithecus* constitutes the powerful evidence that the earliest known offspring of CLCA – may I call him chimp-man or is Pan-Homo better? – lacked several key characteristics of modern African apes (to be listed below). Here we have to distinguish between *Ardipithecus* as a stage or grade or evolutionary level and *Ardipithecus ramidus* the particular species represented by the fossils found in Aramis region of Afar on the Middle Awash river valley in Ethiopia.. There are other members of the Ardi clan, both in Ethiopia (*Ardipithecus kadabba*), Kenya (*Orrion tugenensis*), and Chad (*Sahelanthropus tchadensis*) which are technically distinct genera but basically belong to the same grade; some of them are older than *Ar. ramidus.* Since they are in the same evolutionary grade but significantly older, they are closer to the CLCA period and hence more telling as evidence.

8) Were the data from the other *Ardipithecus* grade sites as complete as those of *ramidus* then we could presume that the basic traits would be found throughout, even in the Chad find (*Sahelanthropus*) which is the oldest, circa 6 Ma. Thus in effect we can say that the *Ardipithecus* grade was attained as early as six million years ago in a broad belt of central Africa in both the Sahel and highland East Africa.

9) *Ardipithecus* was **not** a knuckle walker, unlike either Gorilla or the two Pans. Therefore ancestral Pan-Homo cannot be said to have been a knuckle walker either.

10) Both Gorillas and the two Pans developed knuckle walking independently, after their separation from each other and from the human line. Each evolved separately and achieved

knuckle walking separately. Just to be very clear; this means independently from each other. **Despite appearances and contrary to common sense, each line developed knuckle walking as an innovation on its own and not as a retention from a common ancestor.**This is sometimes called **parallel invention** in ethnology.

11) *Ardipithecus* walked upright and probably could even run a bit. Her feet still had a big toe more like a gorilla's than a human's. However it was inferred that she used that toe to help hold onto tree branches which she walked on too. That is to say, probably not sharply vertical tree branches but more like larger, horizontal ones – basically what is implied by English 'bough' from which swings are suspended. The report also uses the verb 'clamber' to describe Ardi's foot work in trees. First cousin to the verb 'climb' clamber means 'to climb with difficulty, like on all fours'. That is rather more like a leopard's manner of climbing a tree than a chimpanzee's.

12) *Ardipithecus* was **no aerialist** like a gibbon or an orangutan. Probably no Tarzan stuff like swinging from branch to branch, or hanging from a branch. Unlike Gorilla or the two Pans, Ardi was not much into suspending herself from things. One gets the picture of an energetic 10-year old boy climbing trees. The details of her hands, wrists, elbows and arms differ from those of other African apes. They differ from humans too but are more in our direction than towards the other apes. For example her arms are not as long as those of the other apes but they are still longer than ours. And her hands probably lacked the strength to hang 50 kilos of animal casually from a branch, which strength chimpanzees do have. Like us she could probably hang for a little while but longer periods would become quite taxing, as they are for us. Her estimated size was 51 kg by 120 cm or about 112 lbs by nearly 4' tall or roughly the size of a mature Laborador Retriever.

13) Ardi did not live in a rain forest or a closed forest. (Remember Julio Mercader's book on the archeology of rain forests, in MT-10?) She lived in an open woodland, open stretches of grass or other vegetation with 'groves' or 'stands' of trees here and there. She did not live on the savannah or open grassland like the Russian steppes. As defined in the report such clusters of trees could get fairly big with trees up to 10 meters high, like a typical willow tree or maple in North America.

14) The meticulous assembling of floral and faunal data in the report is awesome, thus making the unusual conclusion about Ardi's habitat more convincing. Contrary to a scientific tradition which has mythological elements in it, our ancient ancestor did **not** come down from the trees in a primeval rain forest thereafter to live in the open plains of Africa. Sort of like going from the Congo to the Serengeti plains. While ultimately one can imagine that most primates were originally arboreal and forest dwellers, like the gibbons, orangutans, and so many varieties of monkeys, still we are not required to believe that Ardi's own ancestral CLCA were forest dwellers. There are always the baboons as a counter argument or counter example. In any case Ardi's progeny, the *Australopithecines* did move out to open land, thus validating part of the established story of human evolution.

15) Like the pacific bonobo, and unlike the hot-headed chimpanzees, Ardi displayed few if any indications of social or territorial aggression. While the bonobo seem to think it is better to enter coition than to start a fight, we have no ethnographic reports on Ardi's society. The inference is from her body. Ardi's canine teeth were much reduced from the mean of African apes, almost as much as in humans and about the same as bonobos. Big slashing canines

among African apes is strongly correlated with males and masculine threats and actual fighting. Secondly, the male to female size ratio is much closer to equality, as it is among chimpanzees, instead of the great difference one sees among gorillas and most humans. And lions, elephants, and many other mammals. The great hulking line backer type male seen among gorillas is perhaps the epitome of male dominance. Ardi's folk seemed to have none of that.

16) Ardipithecus was an **omnivore**, probably eating fruits, nuts, tubers, berries, leaves, insects, and probably the odd piece of game (meat) from smaller mammals or birds. This conclusion came from the careful study of Ardi's teeth. While chimpanzee's diet is largely fruit and gorillas are leaf eaters, Ardi was far less specialized.

17) The habitat was dominated by two other mammalian types, to wit, *colobine* monkeys or Gureza and *kudu* type antelopes. Carnivores definitely were present or perhaps visited the area from time to time because the team reported that most of the bone fossils were remains of animals who had been 'ravaged' by predators – hyenas among others. These conclusions were possible because of the meticulous collecting of bone fragments and the like.

18) Ecologically, it is hard to avoid the conclusion that Ardi did not swagger around her habitat like a modern human would. Rather she was an animal among animals and far from the biggest or strongest of them. She was part of the scene, not the conqueror of it. No doubt she was herself on occasion the object of hungry predators.

19) The report says nothing of tools, nor does it report on snakes. Social arrangements which could include defense against predators or communal hunting techniques are absent. In a sense the archeology of the site is missing or perhaps just not reported. Or shall we call it the cultural component? Since there is so much of Ardi and her scene which reminds me of baboons and their intelligent social coping skills, I cannot help wondering if Ardi's society was set up and functioned like baboon society but without the dominant aggressive males. And given baboons' hyper awareness of snakes – in an area with lots of snakes – I wonder how Ardi related to the reptiles.

20) In any case the *Ardipithecus* grade was succeeded by that of *Australopithecus*. Here the tendencies already mentioned for Ardi are closer to fruition. The canines are reduced even more, the feet are clearly for walking, and the skeletal bases for aerialism and brachiation are attenuated. In terms of time these fellows of the famous Lucy were not so long after the time of Ardi. The report even discussed, and rejected, the possibility that Lucy's tribe was a contemporary of Ardi's or perhaps a line of evolution distinct from Ardi's.

21) *Australopithecus* led directly to *Homo habilis,* by which time we are in a different epoch, the Pliocene and about 2.3 Ma and clearly on the path to modern man. Two noteworthy developments occur during this evolutionary stage. First changes in some of the teeth suggest a switch to heavier food which required more robust chewing and thus changes in jaws. The other finds the first evidence of tool making, as well as tool use. This in the time of *Australopithecus robustus*, as evidenced by his hand bones. By now we are at the gates of the Pleistocene, say 1.5 Ma to 2 Ma.

22) By now we have left the team's report behind and are digging into the general literature. Suffice it to say that this period finds Lucy and her kin moving out from the woodlands into

the broader and more dangerous savannahs –the move that used to be attributed to Ardi's stage. It is difficult not to assume, without archeological support, that tool use was a major part of the new adaptation. However, it does no harm to imagine alternatives to the well known and long postulated role of tools. Again the social organization of the baboon is suggestive. Nobody messes with them without thinking about it for a while but again they do have large males with big canines! How do the bonobos survive without them, without the big fanged bullies?

22) One heuristic conclusion which I infer from the team's discussion is that **biogenetics** is first rate or authoritative when it comes to matters of taxonomy. I would alter that to specify taxonomy of the bodies is seen as first rate. Said taxonomy has not been the forté of physical anthropolgy in the past, so this is an important conclusion. I agree with this conclusion.

23) A second heuristic conclusion specifically cited by the team is that it is a mistake to compare two offspring types, two related clades, and to reconstruct a third type, the ancestor, from that evidence only. Comparing chimpanzees with humans led to a false picture of their common ancestor. Only fossil evidence can get the correct answer. Zowie! This conclusion would cripple historical linguistics. We compare Germanic and Indic so as to advance our understanding of the common ancestor, PIE. Of course some Indo-European snobs have sneered that African or Amerind languages which most conspicuously lack fossil ancestors cannot possibly get their ancestors right. Nevertheless it is hard to escape the verdict that finding the fossil ancestor is inherently better than guessing what it would look like! Is there a better way of testing hypotheses of reconstruction? Because that is what they are; not God's Truth but hypotheses.

24) The third heuristic conclusion specifically cited by the team has to do with biogenetic dating. Linguists often disagree with genetic dates, and just as frequently worship them uncritically. (Please don't ask me to mention sources. It would be embarrassing.) Right now genetics is riding a wave of scientific prestige. And to many scholars the geneticists' work is partly perplexing and partly overwhelming. It is complex stuff and typically far beyond our graduate training. Since we have trouble getting dates ourselves[3] , we find it convenient to adopt a genetics date, or an archeological one, to fill in our uncertainty. But paleoanthropology and archeology have good chronological systems themselves, so they can be frank and less than overwhelmed by the biogeneticist's proposed dates. They can disagree without feeling insecure or without being laughed at. They can on the other hand adopt the geneticist's **taxonomy** because here the three fields feel equally competent, with paleoanthropology probably not quite so. But in this report they do disagree with a genetic date and take the time to tell us why they do so. Quoting from p.81 from an article entitled "*Ardipithecus ramidus* and the Paleobiology of Early Hominids"

> "Such considerations also bear on current estimates of the antiquity of the divergence between the human and chimpanzee clades. Many such estimates, suggesting striking recency, have become widely accepted because of the presumed homology of human and African ape morphologies (60[4]) . This obtains despite the recognition that broad assumptions about both the regularity of molecular change and the reliability of

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[3] Sorry for the double entendre here!

[4] Endnote 60 = D.Pilbeam, N.Young, *C.R.Palevol 3,* 305 (2004*)*

> calibration dates required to establish such rates have strong limitations (66, 67)[5]. The homoplasy now demonstrated for hominoids by *Ar. ramidus* provides fair warning with respect to such chronologies, including split times of New and Old World monkeys, hylobatids, and the orangutan. The sparseness of the primate fossil record affecting these estimates is now compounded by the dangers posed by newly recognized complexities in estimating quantitative degrees of genetic separation (66-68). In effect, there is now no a priori reason to presume that human-chimpanzee split times are especially recent, and the fossil evidence is now fully compatible with older chimpanzee-human divergence dates [7 to 10 Ma (2, 69)[6]] than those currently in vogue (70).[7]"

Tim White was the lead author with six colleagues on this piece, suggesting it enjoyed his full support.

The reader has been spared a barrage of special terms which the authors indulge in. Except for well-know biological terms like 'homology' or 'homoplasy', most of the special terms were unknown to me, although in some cases one could figure out what they meant. None of my big dictionaries held them. That is the mystery of paleoanthropogy, their love of incomprehensible words which only they know. It is like a sacred or secret language, known only to the priesthood.

It is clear that these learned and very intelligent scientists are only writing for each other. Some day they will produce another article or a book or a TV program which will explain to the rest of the world what they are saying in detail, but greatly simplified and somewhat romanticized. The editors of SCIENCE let them do this, as they let all the other sciences write in their own jargons. But why? Why are these jargons so glorified? SCIENCE is a major journal and a world leader in prestige of reporting. But the editors do not seem to give a rat's ass whether the general public can understand what is written in their journal or not. Why that might make their journal seem less scientific and they would lose their prestige! Science only for the scientists.. Has anyone else noticed that the man in the street seems to know less and less about science and slowly, slowly anti-scientific attitudes seem to be gaining ground?

It remains only to make salient the paleoanthropologists' critique of genetic dating or molecular genetic dating. The gist is contained in the sentence cited above:

> "This obtains despite the recognition that broad assumptions about both the regularity of molecular change and the reliability of calibration dates required to establish such rates have strong limitations (66, 67)[8]."

The sources are cited in our footnote 5.

These misgivings about genetic dating have been present since the beginning. One may recall from our first discussions of Rebecca Cann's hypotheses, back in the 1980s, that the assumptions underlying their chronological calculations were subject to discussion and disagreement –and doubt. But many of them were probably spot on, correct.

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[5] Endnotes 66,67 are: M.J.L.F. Pulquerio, R.N. Nichols. *Trends Ecol.. Evol.*, 22, 180 (2007) and N.Elango, J.W.Thomas, S.V.Yi *Proc. Natl. Acad. Sci. USA* 103, 1370 (2006).

[6] Endnote 2 and 69 = "We here consider *Hominida*e to include modern humans and all taxa phylogenetically closer to humans than to *Pan* (common chimpanzee and bonobo), that is, all taxa that postdate the split between the lineage leading to modern humans and the lineage that led to extant chimpanzees." And (69) = G. Suwa, R.T.Kono, S.Katoh, B. Asfaw, Y. Beyene, *Nature* 448, 921 (2007)

[7] Endnotes 68 and 70 = R.J.Britten, *Proc. Natl. Acad. Sci. USA 99,* 13633 (2002) and N.Patterson, D.J.Richter,, S. Gnerre, E.S.Lander, D. Reich, *Nature 441, , 1103 (2006).*

[8] Endnotes 66,67 are: M.J.L.F. Pulquerio, R.N. Nichols. *Trends Ecol.. Evol.*, 22, 180 (2007) and N.Elango, J.W.Thomas, S.V.Yi *Proc. Natl. Acad. Sci. USA* 103, 1370 (2006).

What to do with these proposed dates. Certainly we should avoid the enthusiasms which greet each new genetic date, especially among journalists and, yes, linguists. Perhaps we can use the sage advice of Bertrand Russell to fit this problem. He was asked what to do with the problem of lying and liars. His response was something like this:

First we have a man who always tells the truth. We should believe everything he says.

Second, we have the man who always lies, always speaks falsely. We should never believe anything he says.

Third, we have the man who tells the truth half the time and lies half the time. We cannot do anything about him, except to check every thing he says, so as to find out for ourselves what the truth is.

So let it be with molecular genetic dates, as well as glottochronological dates. Doubt them, check them, test them against other evidence. And remember that many times they are correct or not too far off the truth.

Good luck!

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We very much regret that we were not able to get permission to reprint the splendid illustrations which accompanied three pages of that issue of SCIENCE. We were simply not able to contact Mr. Matternes, the illustrator, to get his permission, required by the AAAS. In one case we have re-typed the prose and unskillfully imitated his drawing in order to make the important points conveyed by that page, number 64 of the article.

It is pertinent to quote an old maxim –"**A picture is worth a thousand words**." --which our friends in engineering never fail to advocate. It is true that Mr. Matternes' drawing (figure) on page 64 far exceeds our ability to match him with a page of words; his image is clear, comprehensive, and easy to remember.

Herewith our attempt at drawing, in mere words: (With its caption first)

> "Evolution of hominids and African apes since the gorilla/chimp+human (GLCA) and chimp/human (CLCA) last common ancestors. Pedestals on the left show separate lineages leading to the extant apes (gorilla, and chimp and bonobo); text indicates key differences among adaptive plateaus occupied by the three hominid genera."

***Homo*. Enlarged brain. Dentognathic reduction. Technology- reliant. Old World range. *Homo* (< - 2.5 Ma) ============➔**

***Australopithecus*. Striding terrestrial biped. Postcanine megadontia. Pan-African. Wide niche. *Australopithecus* (4 to 1 Ma)** ==========➔>>>>>>

***Ardipithecus ramidus*. Partially arboreal. Facultative biped. Feminized canines. Woodland omnivore. *Ardipithecus* (6 to 4 Ma)[9] =================➔>>>>**

CLCA *Pan troglodytes* and *Pan paniscus*. Palmigrade arborealist. Dimorphic canines. Forest frugivore /omnivore.
==============================➔>>>>

GLCA *Gorilla gorilla* ==================================➔>>>>>>>>

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[9] *Ardipithecus* refers to the genus name or evolutionary grade, while *ramidus* refers to the species.

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The main thrust of page 64 is, as follows:

"Ardipithecus ramidus and the Paleobiology of Early Hominids"

Tim D. White, Berhane Asfaw, Yonas Beyene, Yohannes Haile-Selassie, C. Owen Lovejoy, Gen Suwa, Giday WoldeGabriel

"Charles Darwin and Thomas Huxley were forced to ponder human origins and evolution without a relevant fossil record. With only a few Neanderthal fossils available to supplement their limited knowledge of living apes, they speculated about how quintessentially human features such as upright walking, small canines, dexterous hands, and our special intelligence had evolved through natural selection to provide us with our complex way of life. Today we know of early *Homo* from >2.0 million years ago (Ma) and have a record of stone tools and animal butchery that reaches back to 2.6 MA. These demonstrate just how deeply technology is embedded in our natural history."

"*Australopithecus*, a predecessor of *Homo* that lived about 1 to 4 Ma (see figure), was discovered in South Africa in 1924. Although slow to gain acceptance as a human ancestor, it is now recognized to represent an ancestral group from which *Homo* evolved. Even after the discovery of the partial skeleton ("Lucy") and fossilized footprints (Laetoli) of *Au. Afarensis*, and other fossils that extended the antiquity of *Australopithecus* to ~ 3.7 Ma, the hominid fossil record before *Australopithecus* was blank. What connected the small-brained, small-canined, upright-walking *Australopithecus* to the last common ancestor that we shared with chimpanzees some time earlier than 6 Ma? "

"The 11 pages in this issue, representing the work of a large international team with diverse areas of expertise, describe *Ardipithecus ramidus*, a hominid species dated to 4.4 Ma, and the habitat in which it lived in the Afar Rift region of northeastern Ethiopia. This species, substantially more primitive than *Australopithecus*, resolves many uncertainties about early human evolution, including the nature of the last common ancestor that we shared with the line leading to living chimpanzees and bonobos. The *Ardipithecus* remains were recovered from a sedimentary horizon representing a short span of time (within 100 to 10,000 years). This has enabled us to assess available and preferred habitats for the early hominids by systematic and repeated sampling of the hominid-bearing strata."

"By collecting and classifying thousands of vertebrate, invertebrate, and plant fossils, and characterizing the isotopic composition of soil samples and teeth, we have learned that *Ar. ramidus* was a denizen of woodland with small patches of forest. We have also learned that it probably was more omnivorous than chimpanzees (ripe fruit specialists) and likely fed both in trees and on the ground. It apparently consumed only small amounts of open-environment resources, arguing against the idea that an inhabitation of grasslands was the driving force in the origin of upright walking."

"*Ar. ramidus*, first described in 1994 from teeth and jaw fragments, is now represented by 110 specimens, including a partial female skeleton rescued from erosional degradation. This individual weighed about 50 kg and stood about 120 cm tall. In the context of the many other discovered individuals of this species, this suggests little body

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size difference between males and females. Brain size was as small as in living chimpanzees. The numerous recovered teeth and a largely complete skull show that *Ar. ramidus* had a small face and a reduced canine/premolar complex, indicative of minimal social aggression. Its hands, arms, feet, pelvis, and legs collectively reveal that it moved capably in the trees, supported on its feet and palms (palmigrade clambering), but lacked any characteristics typical of the suspension , vertical climbing, or knuckle-walking of modern gorillas and chimps. Terrestrially, it engaged in a form of bipedality more primitive than that of *Australopithecus,* and it lacked adaptation for "heavy" chewing related to open environments (seen in later *Australopithecus*). *Ar.amidus* thus indicates that the last common ancestors of humans and African apes were not chimpanzee-like and that both hominids and extant African apes are each highly specialized, but through very different evolutionary pathways."

[End of SCIENCE page 64 quotation.]

The next page is a full copy of SCIENCE page 100, concerned with limbs and body structure which show differences with African apes.

Then SCIENCE pages 82-83 and 62-63 follow.

The Great Divides: *Ardipithecus ramidus* Reveals the Postcrania of Our Last Common Ancestors with African Apes

C. Owen Lovejoy,[1*] Gen Suwa,[2*] Scott W. Simpson,[3] Jay H. Matternes,[4] Tim D. White[5]

Genomic comparisons have established the chimpanzee and bonobo as our closest living relatives. However, the intricacies of gene regulation and expression caution against the use of these extant apes in deducing the anatomical structure of the last common ancestor that we shared with them. Evidence for this structure must therefore be sought from the fossil record. Until now, that record has provided few relevant data because available fossils were too recent or too incomplete. Evidence from *Ardipithecus ramidus* now suggests that the last common ancestor lacked the hand, foot, pelvic, vertebral, and limb structures and proportions specialized for suspension, vertical climbing, and knuckle-walking among extant African apes. If this hypothesis is correct, each extant African ape genus must have independently acquired these specializations from more generalized ancestors who still practiced careful arboreal climbing and bridging. African apes and hominids acquired advanced orthogrady in parallel. Hominoid spinal invagination is an embryogenetic mechanism that reoriented the shoulder girdle more laterally. It was unaccompanied by substantial lumbar spine abbreviation, an adaptation restricted to vertical climbing and/or suspension. The specialized locomotor anatomies and behaviors of chimpanzees and gorillas therefore constitute poor models for the origin and evolution of human bipedality.

Thomas Huxley published *Evidence as to Man's Place in Nature* (*1*) only 4 years after Darwin's *On the Origin of Species*. Its frontispiece featured a human skeleton and four suspensory adapted apes, each posed upright and each obviously more human-like than any pronograde Old World monkey. By century's end, Keith was enumerating a cornucopia of characters in support of a brachiationist human past (*2*). Even our pericardial-diaphragmatic fusion, hepatic bare area, and colic mesenteries were interpreted as adaptations to orthogrady, evolved to tame a flailing gut in the arboreal canopy. Bipedality was simply habitual suspension brought to Earth (*3*). The "suspensory paradigm" for early hominid evolution was born.

Challenges, however, were mounted. Straus enumerated disconcertingly primitive human features in "The Riddle of Man's Ancestry" (*4*), and Schultz doubted that brachiation "… opened the way automatically for the erect posture of modern man" [(*5*), pp. 356–357]. Although withdrawal of the ulna from its primitive pisotriqetral recess was thought to be the sine qua non of suspension (*6*), a functional equivalent was discovered to have evolved in parallel in the wrists of never-suspensory lorisines (*7*). African ape knuckle-walking (*8*), considered by many too bizarre to have evolved independently in *Gorilla* and *Pan*, came to be viewed in light of emergent molecular phylogenetics (*9*) as a natural successor of suspensory locomotion—and by some as the almost-certain default engine of bipedality (*10*).

A flood of morphometric analyses appeared to confirm arguments for knuckle-walking hominid ancestors [reviewed in (*11*)], even though hints of the behavior were also seen in captive orangutans (*12*). Knuckle-walking was surmised to be a natural consequence of irreversible modifications of the forelimb skeleton to facilitate advanced suspension and vertical climbing (*11*). It was thereby hypothesized to be an adaptive signal of the first two phases of a deterministic succession leading to bipedality: advanced suspension/vertical climbing → terrestriality/knuckle-walking → bipedality.

A compendium of observations of chimpanzees and bonobos performing upright stance and locomotion followed. Accumulating molecular biology propelled this troglodytian paradigm (conceived as a natural succession to its older, suspensory counterpart) to near-consensus. Chimpanzee-human protein homologies and DNA base sequence comparisons (*9*, *13–16*) established *Homo* and *Pan* as likely sister clades [today further confirmed by comparative genomics (*17*, *18*)]. The only question remaining seemed to be whether the bonobo or chimpanzee represented the best living proxy for the last common ancestor (*19–22*).

The Chimpanzee model and *Australopithecus*. The discovery and recognition of the then-primitive *Australopithecus afarensis* during the 1970s (*23*) pushed the hominid record back to 3.7 million years ago (Ma). Although its postcranium was recognized to harbor unusually sophisticated adaptations to bipedality [reviewed in (*24*)], a feature confirmed by human-like footprints at Laetoli (*25*, *26*), many interpreted these fossils to represent the closing argument for the troglodytian paradigm [see, e.g., (*27*)]. Only the recovery of earlier, chimpanzee-like fossils from the Late Miocene seemed necessary to complete this scenario [even though newer *Australopithecus* fossils have led at least one discoverer to doubt a chimpanzee-like ancestry (*28*)]. Until now, the few available fossils of appropriate antiquity have remained largely uninformative (*29–31*).

The *Ardipithecus ramidus* fossils from 4.4 Ma Ethiopia are obviously not old enough to represent the chimpanzee/human last common ancestor (CLCA; the older common ancestor of hominids and both *Gorilla* and *Pan* is hereafter the GLCA). However, their morphology differs substantially from that of *Australopithecus*. The *Ar. ramidus* fossils therefore provide novel insights into the anatomical structure of our elusive common ancestors with the African apes. For that reason, and because of its phylogenetic position as the sister taxon of later hominids (*32*), this species now provides opportunities to examine both the suspensory and troglodytian paradigms with greater clarity than has previously been possible. Here we first provide evidence of limb proportions, long considered to bear directly on such issues, and then review key aspects of the entire *Ar. ramidus* postcranium. Comparing the basic proportions and postcranial anatomy of *Ar. ramidus* (Fig. 1) with those of apes enables us to propose the most probable anatomies of the last common ancestors of *Gorilla*, *Pan*, and the earliest hominids. Much of the relevant information on *Ar. ramidus* is based on the partial skeleton from Aramis (*32*).

Body mass. The geometric means of several metrics of the capitate and talus are strongly related to body mass in extant primates (correlation coefficient $r = 0.97$; fig. S1), and can be used to estimate body mass in *ARA-VP-6/500*, as well as in *A.L. 288-1*. Restricting the sample to large-bodied female hominoids predicts that *ARA-VP-6/500* had a mass of about 51 kg. The metrics for *A.L. 288-1* fall below those of all extant hominoids. We therefore used the female anthropoid regression to estimate the body mass of *A.L. 288-1* (26 kg), which is consistent with previous estimates (*33*) (table S1). Based on several shared metrics, *ARA-VP-7/2*, a partial forelimb skeleton (*32*), was slightly smaller than *ARA-VP-6/500* [supporting online material (SOM) Text S1].

Given the apparent minimum body size dimorphism of *Ar. ramidus* (*32*, *34*), the predicted

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Table 1. The assembly of shared derived characters among early hominid taxa.

Craniomandibular characters	**Chimp/human LCA (INFERRED)**	***Ar. kadabba/Sa. tchadensis/ O. tugenensis***	***Ar. ramidus***	***Au. anamensis***	***Au. afarensis***
TMJ articular eminence	flat	flat	flat	TMJ with defined eminence	TMJ with defined eminence
Mandible corpus breadth	indeterminate	mandibular corpus broad	mandibular corpus broad	mandibular corpus broad	mandibular corpus broad
Mental foramen	indeterminate	circum mid-corpus ht	circum mid-corpus ht	circum mid-corpus ht	secondarily lowered
Mandibular lateral prominence	weak	weak	weak	intermediate	lateral prominence developed
Ramus root/ extramolar sulcus	root posterior, sulcus narrow	root posterior, sulcus narrow	root posterior, sulcus narrow	intermediate	ramus root anterior and wide extramolar sulcus
Symphyseal inclination	strong	strong	strong	strong	bulbous (Laet.) to vertical (AL, MAK)
Basion position	slightly posterior	anterior	anterior	indeterminate	anterior
Cranial base flexion	moderate midsagittal flexion, orbital kyphosis minimal	advanced?	advanced	indeterminate	advanced
Midfacial breadth	not extreme	not extreme	not extreme	indeterminate	midfacial breadth greater
Zygomatic root	zygomatic root c. M1	zygomatic root c. M1	zygomatic root c. M1	zygomatic root more anterior	zygomatic root more anterior
Incisor/lower canine step	present	indeterminate	present	absent	absent

Dental characters	**Chimp/human LCA (INFERRED)**	***Ar. kadabba/Sa. tchadensis/ O. tugenensis***	***Ar. ramidus***	***Au. anamensis***	***Au. afarensis***
Sectorial C/P3 shearing	present, strong in males	sometimes present? in reduced expression?	absent	absent	absent
Canine size dimorphism	dimorphic	reduced C size dimorphism	further reduction?	further reduction	further reduction
Female relative canine size	moderate	moderate	moderate	slightly smaller	slightly smaller
Upper canine shape feminization	males unfeminized, higher crowned, modally lower shoulder	male C feminized in shape	male C feminized in shape	male C feminized in shape	male C feminized in shape
shoulder height	females mostly mid to low	mostly mid to low?	mid to high	mid to high	sometimes extremely high
shoulder flare	weak	weak	distinct flare	distinct flare	distinct flare
lingual marginal ridge	weak	intermediate?	fold-like	fold-like	fold-like
main mesial lingual ridge	strong (secondarily weak in *Pan*)	strong	basally broad	less prominent	more spatulate
crown height	males tall, females moderate	indeterminate	UC height differentially reduced	reduced	reduced
Lower canine shape feminization	males higher crowned, modally low mesial shoulder, weak/ no distal tubercle	feminized	feminized	feminized	feminized
mesial shoulder height	females vary from low to high	varies from low to high	intermediate?	intermediate?	LC with high mesial shoulder
lingual marginal ridge	weak or none	intermediate?	fold-like	fold-like	fold-like
distal crest	usually weak or none	weak	weak	intermediate	distinct
distal tubercle	weak	developed	developed	variable	distal tubercle less distinct merges with distal crest
Canine enamel thickness	thin	thin	thin	intermediate	thicker
Lower third premolar					
wear	hones UC	rarely hones, distal UC wear steep	No hone, distal UC steep	horizontal wear more dominant?	horizontal wear more dominant
basal crown size/shape	obliquely elongate	intermediate?	elongation weaker, relatively smaller size	basally expanded and large	tends to be BL broader
height	tall, with MB cervical extension	intermediate?	MB cervical extension weaker	low, squat, weak extension	weaker extension
metaconid	absent or rudimentary	rudimentary	rudimentary	rudimentary	variably developed
transverse crest	tall, near-transverse to posteriorly directed	near-transverse	near-transverse	near-transverse	more clearly transverse
mesial marginal ridge	weak or none	intermediate?	distinct	distinct	tends to form developed anterior fovea
Upper third premolar					
anterior fovea	not developed, steep anterior face	weak delineation	better defined	better defined	tendency for more horizontal fovea
asymmetry	weak to moderate	weak to moderate	weak to moderate	weak to moderate	symmetry more frequent

← LCA → ← Hominid clade →

Key: Primitive condition | Intermediate derived condition | Derived condition

table continued

Table 1. The assembly of shared derived characters among early hominid taxa—*continued*.

Dental characters *(continued)*	**Chimp/human LCA (INFERRED)**	***Ar. kadabba/Sa. tchadensis/ O. tugenensis***	***Ar. ramidus***	***Au. anamensis***	***Au. afarensis***
Lower deciduous molar					
crown shape	buccolingually narrow	indeterminate	buccolingually narrow	intermediate	broad, with developed anterior fovea
protoconid dominance	strong	indeterminate	strong	intermediate	larger metaconid
talonid	little developed	indeterminate	little developed	intermediate	posterior cusps well defined
Molars					
lower molar shape	indeterminate	relatively broader	relatively broader	relatively broader	tends to be very broad
molar row length	moderate	moderate	moderate	size increase	further increase
lower M3 development	variable, usually weak distal crown	variable, usually weak distal crown	variable, usually weak distal crown	large M3 with better developed distal crown	further LM3 complexity
occlusal foveae	moderately broad	moderately broad	moderately broad	narrower (increased basal flare)	narrower (increased basal flare)
crown height	low	low	low	intermediate?	taller M1 crown height
Molar enamel thickness	intermediate, variable	intermediate, variable	intermediate, variable	tends to be thicker	thicker
Canine eruption	males with delayed canine eruption	indeterminate	lacks delayed canine eruption	lacks delayed canine eruption	lacks delayed canine eruption
Premolar to molar wear gradient	slow P3 wear	indeterminate	slow P3 wear	increase of apical P3 wear	increase of apical P3 wear

Postcranial characters	**Chimp/human LCA (INFERRED)**	***Ar. kadabba/Sa. tchadensis/ O. tugenensis***	***Ar. ramidus***	***Au. anamensis***	***Au. afarensis***
Iliac isthmus	superoinferiorly long	indeterminate	short	indeterminate	short
Pubic symphysis outline	superioinferiorly long	indeterminate	short	indeterminate	short
Ilium/iliac isthmus orientation	coronal	indeterminate	sagittal	indeterminate	sagittal
Iliac breadth	moderately broad	indeterminate	slightly broadened	indeterminate	further broadened with expanded sciatic notch
Anterior inferior iliac spine	not developed	indeterminate	strong, formed by separate ossification center	indeterminate	strong, formed by separate ossification center
Pubic ramus	mediolaterally short	indeterminate	mediolaterally short	indeterminate	elongated
Ischium	long	indeterminate	long	indeterminate	abbreviated
Ischial tuberosity	not angulated	indeterminate	not angulated (INFERRED)	indeterminate	angulated
Greater sciatic notch	not developed	indeterminate	weak	indeterminate	well-developed
Femoral hypotrochanteric fossa	lacks true fossa	lacks true fossa	lacks true fossa	intermediate?	true fossa
Third trochanter and gluteal ridge	strong/rugose 3rd trochanter leading to laterally placed gluteal line	strong/rugose 3rd trochanter leading to laterally placed gluteal line	3rd trochanter weaker but same pattern	3rd trochanter weaker but same pattern	3rd trochanter localized, gluteal line angles medially
Femoral linea aspera	widely spaced med and lat lips	widely spaced med and lat lips	widely spaced med and lat lips	widely spaced med and lat lips	usually true linea aspera
Femoral neck cortical distribution	superior cortex relatively thick	superior cortex relatively thick	indeterminate	indeterminate	superior cortex relatively thin
Hallux	fully abductable, no dorsal doming	indeterminate	fully abductable, no dorsal doming	indeterminate	permanent adduction of hallux, dorsal doming
Second metatarsal	not robust	indeterminate	shaft and base robust	indeterminate	secondary gracilization
Metatarsal heads (rays 2–5)	limited dorsal doming	indeterminate	dorsally domed (Mt3 known)	indeterminate	dorsally domed .
Proximal foot phalangeal cant	proximal orientation	indeterminate	upwardly canted	indeterminate	upwardly canted orientation
Trapezoid	mediolaterally narrow	indeterminate	mediolaterally narrow	indeterminate	broader
Capitate	head located palmarly	indeterminate	head located palmarly	head dorsalized and broader	head dorsalized and broader
Metacarpal heads	moderate dorsal constriction	indeterminate	weak, but constriction still seen	indeterminate	constriction lacking
Metacarpal distal end	moderate/strong proximal collateral ligament facets	indeterminate	intermediate?	indeterminate	weak collateral ligament grooves
Skeletal size dimorphism	weak	indeterminate	weak	indeterminate	moderate
Megadontia relative to body size	weak	indeterminate	weak	expressed (INFERRED)	distinct

← LCA →← Hominid clade →

Key: Primitive condition | Intermediate derived condition | Derived condition

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In Memory of Daniel F. McCall

Codicil to *Ardipithecus ramidus*
"A rag, a bone, and a hank of hair"

Harold C. Fleming

Subsequent to the publication of the White team's material on *Ardipithecus ramidus*, the scientific world received another shock – in *NATURE,* the other leading scientific journal in the world. The British journal reported this Spring (2010) that a Russian team and a familiar geneticist had found a human species in Siberia that was possibly older than either *Homo sapiens sapiens* and *Homo sapiens neandertalensis.* Discovered in Denisova Cave in the Altai, the evidence consisted of ONE FINGER BONE !

With a chorus of disbelief potentially resounding in the ears, like "what can you tell from one lousy finger?", the evidence was soon to be revealed as molecular genetic. But this time the dating problem was diminished by the simple fact that the bone came from a dated archeological site of 30,000 to 48,000 years. The area had plenty of Mousterian and Levalloisian culture and evidence of *Neanderthal* occupancy, so the finger was at least Upper Paleolithic, if not much older.

The Russian archeologists handed the bone, carefully protected against contamination, to our colleague, Svante Pääbo of the Max Planck Institute in Leipzig, Germany. After very careful examination of the finger and many tests of the DNA, Svante's team concluded that this was the mtDNA of another species of human, more remote than the connection between *Neanderthals* and modern humans (or *Cro-Magnon* for the matter). One crucial measure was this: "Although a *Neanderthal* mtDNA genome differs from that of *Homo sapiens* at 202 nucleotide positions on average, the Denisova Cave sample differed at an average of 385 nucleotides." It would have been even more convincing if they had said how much the Neanderthals differed from the 'people of the finger'. (*Homo digitensis*?)

Taxonomically their conclusion was that the 'people of the finger' were more remote from us than Neanderthals were. A further conclusion was that the relationship was older than *H.sapiens* vs. *H.heidelbergensis*, the ancestor of Neanderthal. Since that ancestor lived up to 500 kya , then the date of *Homo digitensis* was older than that. Using that information and perhaps a Ouija board, they concluded that *Ur-digitensis* would be 1 mya or 1000 kya. As one can tell, I am sceptical of that date. But not their taxonomy. The weakness and the strength of molecular genetic reasoning.

Another sceptic is Eske Willerslev, an evolutionary biologist at the University of Copenhagen. She was quoted as saying that "With the data in hand, you cannot claim the discovery of a new species." Moreover, she is quoted as emphasizing that the mtDNA evidence, on its own, does not verify that the Siberian find represents a new species because mtDNA is inherited only from the mother. It is possible that some modern humans or Neanderthals living in Siberia 40,000 years ago had unusual mtDNA , which may have come from earlier interbreeding among *H. erectus*, Neanderthals, archaic modern humans or another, unknown species of *Homo*. Only probes of the nuclear DNA will properly define the position of the Siberian relative in the human family tree. Those considerations are, of course, possible but I am willing to bet that Svante is correct in this classification, if not in the date.

This exchange illustrates once again how important scientific questions can be concealed in ordinary arguments. Svante Pääbo had examined the evidence and proposed an hypothesis. Eske Willerslev in her critique suggested alternative hypotheses or at least the need to look for new evidence which would in effect test, and possibly falsify, Svante's hypothesis

Owen Lovejoy of Kent State University, one of the Ardi team, also gave an opinion. "The stratigraphic age for the bone is 30,000 to 48,000 years old, but the mtDNA age could be as old as *H. erectus*. That doesn't tell us much about human evolution unless it truly represents a surviving ancient species." That comment baffled me! If an unknown species of our genus survived in Central Asia from 'one million BC' until the advent of modern man to that area, you don't think that is interesting? Not informative? Since Owen Lovejoy is a first class thinker about human prehistory, I suspect that I have misunderstood his comment. Let us hope so!

Equally intriguing is the bit of cultural data unearthed by the archeologists. On the same level that yielded the bone, they found a fragment of a polished bracelet with a drilled hole. Some of the other potential inhabitants could have made such an artifact but that could mean that they lived close to *Homo digitensis.* Alas we have no cultural history to relate these people to; they have left no archeological record that we know of. Since some scholars like Richard Klein believe that art work was a characteristic of the Aurignacian *Homo sapiens* moving out from Africa, perhaps this bracelet with drilled hole was their work instead. Since it could be dangerous to encounter those Aurignacian folks, then the 'people of the finger' would not have long to live.

Svante Pääbo had the last word in the discussion. He was reported to suspect that other human ancestors and new mysteries might emerge as geneticists grind up more ancient bones for sequencing. He said that it was "fascinating that molecular studies make a contribution to palaeontology where there is little or no morphology preserved. It is clear we stand just at the beginning of many fascinating developments."

He should know, having been a pioneer in these studies!

- -

[Hank] was probably borrowed from Old Norse. It means a 'coil' or a 'ring'. Although it is not used very often in conversation, it has a strong old Saxon feel to it. Like 'rank, dank, stank, prank, bank, sank, tank, blank, and Yank' and others. (We have to stop here!)

But our next topic is centered on a hank of hair, a hair coil taken from a glacier, associated with some cultural remains, and dated to 4000 years ago. The date is archeological, not molecular. It seems remarkable what these scholars have done with something that would be disregarded on a barber shop floor. They reported on their feat in vol. 463 of *NATURE* on February 11, 2010, pages 757-762.

Because the authors specified that two of them had contributed equally to the article, and maybe to the work, we will list those two and cite the 50 other authors as 'et al'. The article thus is Morten Rasmussen and Yingrui Li, et al. It is obviously a collaboration between the University of Copenhagen and BGI-Shenzhen, Shenzhen, China. We reckon that BGI represents BioGeneticInstitute. One of our members, Richard Villems of Tartu, Estonia, is part of this team, as well as Eske Willerslev, mentioned earlier.

The article's title is: Ancient human genome sequence of an extinct Palaeo-Eskimo.

Their abstract or summary is, as follows:

"We report here the genome sequence of an ancient human. Obtained from ~ 4,000 year-old permafrost-preserved hair, the genome represents a male individual from the first known culture to settle in Greenland. Sequenced to an average depth of 20X, we recover 79% of the diploid genome, an amount close to the practical limit of current sequencing technologies. We identify 353,151 high-confidence single-nucleotide polymorphisms (SNPs) , of which 6.8% have not been reported previously. We estimate raw read contamination to be no higher than 0.8%. We use functional SNP assessment to assign possible phenotypic characteristics of the individual that belonged to a culture whose location has yielded only trace human remains. We compare the high-confidence SNPs to those of contemporary populations to find the populations most closely related to the individual. This provides evidence for a migration from Siberia into the New World some 5,500 years ago, independent of that giving rise to the modern Native Americans and Inuit."

There are four things about this paper which are of interest to us. First, naturally is the hank of hair. That is not unprecedented but it is hardly common yet. Second, the phenotypes! Genotypes have replaced phenotypes in biological anthropology but here we have phenotypes being reconstructed on the basis of genetic data. The individual had blood group type 'A+' and brown eyes, dark thick hair, skin color darker than European, and some tendency to baldness. He also probably had shovel-shaped incisors and dry ear wax. There is also a suggestion from inferred metabolism and body mass index that he was adapted to a cold climate. Since these are all phenotypic traits associated with the old racial category, Mongoloid, except for blood type A+, one expected them to find evidence of the epicanthic eyefold, perhaps the most outstanding characteristic of people called 'Mongoloid', although that trait is less common in native North Americans than in north Asians, especially temperate zone peoples like Chinese, Koreans, and Japanese. Since blood group type A+ is common among north Europeans outside of the western fringe of high Rh negative, one can be sceptical of their conclusion in this respect.

Third, the populations most closely suited for, or related to, the Greenland hair hank, turn out to be northeast Siberians, rather than Eskimo (Inuit). Such as the Chukchi, Koryaks, and Nganasans (north Samoyed) also live in the coldest region on Earth, north of Antarctica. Linguistically, these peoples are in the same large family, Eurasiatic of Greenberg, with the Eskimo and the Aleuts. The study continues the irritating custom of labeling all the groups of Eskimo as Inuits, when Inuit is only one group of the

Eskimo.Yupik (Alutiiq and proper Yupik) and Siberians (Sirenik, Chaplino, Naukan) being some others. There is also the underlying conclusion that the Eskimo and Aleut are the next closest kin.

Fourth, while their site is associated with the Saqqaq Culture of western Greenland, part of the Arctic Small Tool tradition, extant between 4750-2500 years ago, they draw the conclusion that the older migration from Siberia had been 5500 years ago. This is not as arbitrary as it might seem. First they calculated divergence time between Saqqaq and Chukchi of between 175-255 generations from which they derived a date of 4400-6400 years or 5400 as the mid value. Then, since the oldest archeological evidence of the Arctic Small Tool tradition in North America is from Kuzitrin Lake, Alaska, dating back 5500 years, they concluded that the ancestral Saqqaq separated from their Siberian relatives almost immediately before their migration into Alaska and hence Greenland.

This is the kind of dating we need when combining genetic calculations with prehistory. We must salute the Rasmussen-Li team!

We must also beg our molecular friends to make their diagrams and figures more intelligible. They are terribly complicated and difficult to read, not to mention understand! This article has a typical family tree type chart, set up with lots of information about taxonomy but almost impossible to relate to because nothing was named properly. The authors should also beg *NATURE* for more space to show their diagrams and figures; everything is crammed inside a third of a page. A rich journal dealing with important scientific information can do much better than this!

MOTHER TONGUE
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In Memory of Daniel F. McCall

What Does the Berber Proto-phoneme *H Stand for?

Arnaud Fournet

Abstract :

The article intends to show that the Proto-Berber proto-phoneme identified by Prasse and written as a kind of "laryngeal" with the symbol H is not a guttural phoneme but the Berber reflex of the glottalized labial stop of Proto-Afrasian. Several convergent clues add up to a clear case for this identification.

Terminological Prolegomena

I have chosen to use the "standard" English word *Afrasian* in the article.[1] I am not really happy with it but the more traditional *Hamito-Semitic*, which I would have preferred, seems to carry unpalatable racialist undertones which its French equivalent does not have. On the whole, I tend to adhere to a conservative perimeter of the "Afrasian" family. Following Marcel Cohen's works, I agree that there is a reasonable probability that Semitic, Egyptian and Coptic, Berber together with (some parts of) Cushitic and Hausa (and some parts of Chadic) add up to a valid genetic node. I consider this family to be highly probable but insufficiently proved for the time being and I disapprove the uncontrolled extension of its perimeter that the word *Afrasian* or *Afro-Asiatic* entails. I am not far from considering that for the time being the words Cushitic, Chadic and Omotic do not have any reliable descriptive content and that these sub-"families"(?) are unproved nodes and quite possibly fictitious genetic entities. In all cases, I tend to disagree with the hyper-africanization of this group of languages, that *Afrasian* and *Afro-Asiatic* entail under the pen of most authors who use these words. I will nevertheless use *Afrasian* but the reader should know that this does not mean at all that I endorse the "usual" perimeter ascribed to the "Afrasian" family.

Present Day Hamito-Semitic (Afrasian) Studies

As mentioned above, my personal assessment of "Afrasian" is that the scientific status of that "family" still does not meet the requirements of an established "truth". All the components of that "family" lack a satisfactory internal and external analysis and description.

Semitic, to start with, is not really understood. As regards Arabic, I consider the theory of George Bohas to be among the most interesting and stimulating approaches. The theory proposed and developed by Bohas contains several premices that are very surprising at first sight but there is little doubt that the Arabic lexical material supports most of this disconcerting approach. My area of disagreement is about the diachronic interpretation and the status of the so-called "matrices" and "étymons" in this theory. For the time being, in spite of numerous attempts, I consider that the understanding of Proto-Semitic biliteral roots in mainstream comparative work is very low. Moreover, I have been able to establish that Proto-Arabic still had a full set of lateral fricatives: voiced, voiceless and emphatic on the basis of phonetic alternations embedded in the vocabulary of classical Arabic alone. (The article has been accepted by ZAL *Zeitscrift für Arabische Linguistik.*) It is amazing that comparatists have not been able to establish the existence of the voiced lateral fricative at the "Afrasian" level, when it can be evidenced on the basis of Arabic alone. This shows the impressive scientific immaturity of the field in general. Moreover, it has long been noticed that the reconstructions of Proto-Semitic tend to propagate in Hittite, Hurrian, and other neighboring languages written in cuneiform script, phonetic values that are obviously unacceptable: *š must be /s/ and *s must be an affricate, to start with.

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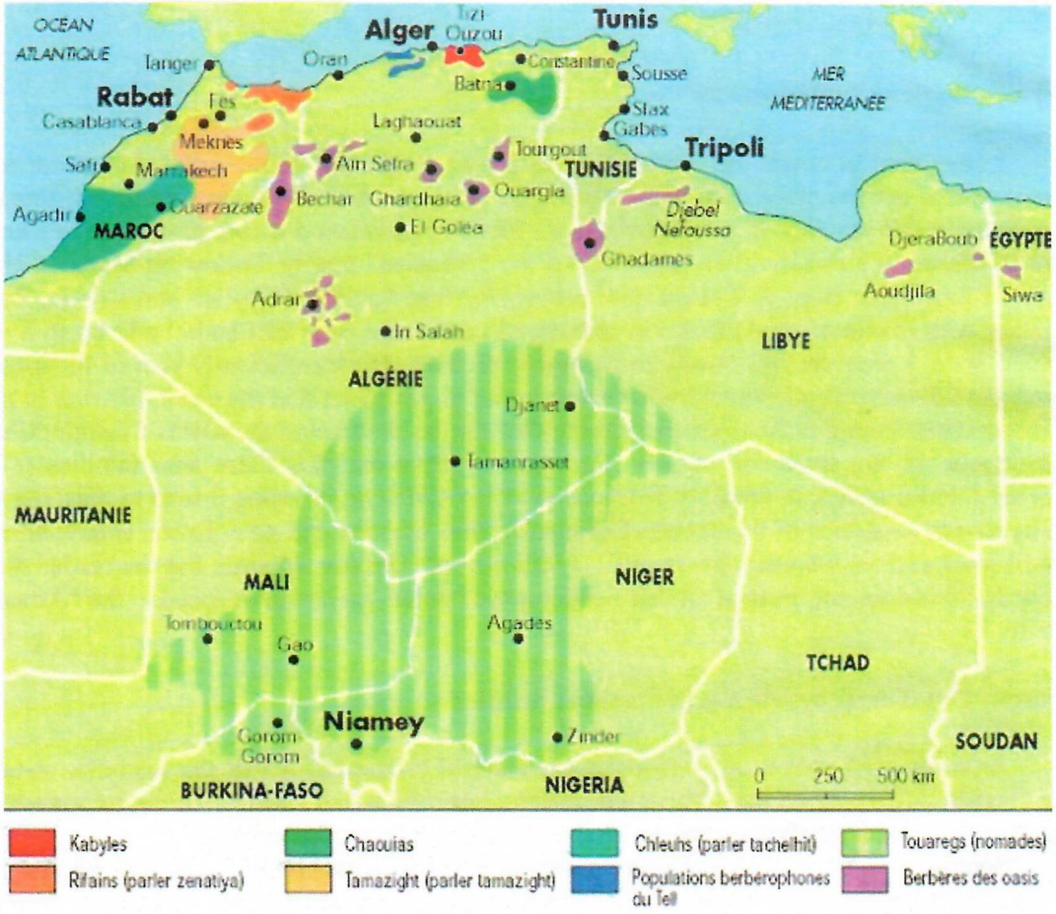
[1] In conformity with this, the abbreviation "PAA" (Proto-Afrasian) has been substituted for the author's original "CS" (Chamito-Sémitique = Hamito-Semitic) [Ed.].

The reconstruction of hieroglyphic Egyptian in relationship with Coptic is still in the making. Some works exist but the task cannot be considered finished nor even significantly advanced. The phonology of Egyptian and Coptic remains unsecure and there is no internal and external dictionary of Egyptian and Coptic on which comparative studies could rely in spite of Vycichl (1999) and Takács (1999-2008). This branch cannot really be harnessed and used.


OCEAN ATLANTIQUE
Tanger
Rabat
Casablanca
Fes
Meknes
Safi
Marrakech
Agadir
Ouarzazate
MAROC
Oran
Alger
Tizi Ouzou
Batna
Constantine
Tunis
Sousse
Sfax
Gabes
Laghaouat
Ain Sefra
Bechar
Ghardhaia
Ouargla
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MAURITANIE
MALI
NIGER
Tombouctou
Gao
Agades
TCHAD
Gorom Gorom
Niamey
Zinder
SOUDAN
BURKINA-FASO
NIGERIA
0
250
500 km
Kabyles
Rifains (parler zenatiya)
Chaouias
Tamazight (parler tamazight)
Chleuhs (parler tachelhit)
Populations berbérophones du Tell
Touaregs (nomades)
Berbères des oasis

Map of the Berber "Languages" according to S. Chaker (Inalco)

The Berber branch is most probably the least studied and understood of all sub-families, especially in works written in English. Ehret (1995) does not even deal with any Berber data. I am quite amazed that Omotic can be declared to be related to Berber, when Berber is not even remotely and scantily dealt with. This kind of methodology is unacceptable in the first place. I have established that the gutturals of "Afrasian" have not muted out as is generally believed but have become palatalized in Berber. The article that shows this development should appear soon in *Langue et Littérature Moderne Arabe*.

Considering the current real status of these three basic branches of "Afrasian", it makes little sense to talk about items like Omotic or Chadic. I cannot accept the rather optimistic assessment in Bomhard (2008:11) that "the major sound correspondences [of "Afrasian"] have been determined with great accuracy". There are glaring holes in these correspondences and this article will try to shed some light on one of these holes, the so-called *H phoneme of Proto-Berber. Neither can I agree that "excellent progress is being made in reconstructing the common lexicon", when Ehret (1995) cited by Bomhard (2008:12) as an indication of that progress does not even deal with Berber data at all and miserably deals with Egyptian and Semitic. I nevertheless agree that the other work cited by Bomhard (2008:11), namely the dictionary by Vladimir E. Orël and Olga V. Stolbova (1995), is a work worth reading, which should encourage future steps forward. Needless to say that this work can only be considered as an intermediary stage and as a provisional survey.

The Berber "Languages"

The Berber family is a linguistic entity with easily recognizable features from the morphological and phonetic point of view. In addition to the Touareg group in the south of the Berber-speaking area, there remains in Morocco a large percentage of Berber native speakers, who can be assigned to three main dialectal areas: Chleuh (or Tachelhit, Tasusit) in south Morocco, Amaziɣ (or Tamaziɣt) in the center and Rifian (or Tarifit) in the north. In Algeria, the main dialects are Kabyle (or Taqbaylit) and Chawi (or Taçawit) in the Aurès mountains. These dialects are still spoken by several million people on a daily and regular basis. Some vulnerable and isolated spots in Egypt, Libya, Tunisia and Mauritania still exist. The usual tradition in French resorts to the word *dialect* rather than *language* to describe the different Berber idioms. We will keep this word which is used by most Berberologists among whom Salem Chaker is one of the most active. In the rest of the article, we will add a capital letter to the names of the dialects as is usual in English.

The Available Documentation

The field can be divided into three sub-branches:

- the eastern dialects, spoken in Egypt and eastern Libya,
- the southern or Touareg dialects, spoken in southwestern Sahara and the Sahel area,
- the northern dialects, in the Maghreb area, Morocco and Algeria for the most part.

The different "dialects" are not known with the same level of refinement and reliability. A survey of the currently available documentation is as follows:[2]

1. Eastern Berber dialects:
    - Augila (Libya) known thanks to Paradisi (1960)
    - Siwa (Egypt) known thanks to Laoust (1932)
2. Southern Berber (Touareg) dialects:
    - Tahaggart (Algeria) very well known thanks to Foucault (1951) and Prasse (1960 & 1993)
    - Tadaght (Mali) known thanks to Heath (2006)[3]

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[2] I follow Kossmann (1999:26-29) with additions both personal and suggested by the reviewers.

  - Taneslemt (Mali) poorly known
  - Tawellemmet (Niger) very well known thanks to Prasse (1998)
  - Tayrt (Niger) very well known thanks to (Prasse (1998 & 2003)
  - Zenaga (Mauritania) very well-known thanks to Taine-Cheikh (2008)

3.1. Northern Berber dialects:

  - Tachelhit (Morocco) very well known
  - Tamaziγt (Middle Moroccan Atlas) very well known thanks to Taifi (1991)
  - Kabyle (Algeria) well known thanks to Dallet (1982)
  - Chenoua (Algeria) known thanks to Laoust (1912)

3.2. Northern Berber dialects of the zenati sub-group:

  - Senhaja de Sraïr (Northern Morocco) well known thanks to Ibañez (1959)
  - Ait Seghrouchen (Central Morocco) known thanks to Taifi (1991) and Pellat (1955)
  - Beni Iznasen (Morocco) known thanks to Destaing (1914) and Renisio (1932)
  - Tarifit (Morocco) well known thanks to Allati (1986) and Ibañez (1944)
  - Beni Snous (Algeria) known thanks to Destaing (1914)
  - Figig (Morocco, Algeria) well known thanks to Kossmann (1997) and Saa (1995)
  - Mẓab (Algeria) known thanks to Delheure (1984)
  - Wargli (Algeria) very well known thanks to Delheure (1984)
  - Timimum (Algeria) known thanks to Boudot-Lamotte (1964)
  - Beni Menacer (North-western Algeria) known thanks to Destaing (1914)
  - Chawi (Algeria) well known thanks to Basset (1961)
  - Metmata (Tunisia) known thanks to Destaing (1914)
  - Ghat (Libya) unsecurely described in Nehlil (1909)
  - Ghadames (Libya) well known thanks to Lanfry (1968 & 1973)
  - Zuara (Libya) known thanks to Mitchell (1957)
  - Efoqaha (Libya) known thanks to Paradisi (1963)
  - Nefusa (Libya) well known thanks to Beguinot (1931) and Provasi (1973)

The Zenati sub-group of Northern Berber displays several innovations and morphological levelings that cannot be found in Tachelhit and in Kabyle, which makes these two dialects more conservative items than is usually assessed. It is incorrect to think that only Touareg is conservative. Moreover, it must be noted that the dictionary of Berber roots compiled by Kamal Nait-Zerrad is immensely useful for any comparative work involving Berber. Unfortunately, only the letters A to G have already been published.

We have no opinion about the genetic relationship of Guanche.

The Issue Of The Proto-Phoneme *H In Berber

According to the theory of Proto-Berber *H as first developed by Karl Prasse (1969), the Berber vocabulary displays a particular phonetic correspondence:

- in Tahaggart, the voiced laryngeal fricative /h/ is found,
- in Libyan Berber, in Ghadames or Augila, the labial spirant /β/ is found,
- elsewhere, no apparent trace seems to exist. [NB In fact we will see that traces can be found.]

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[3] Apparently, this is the only recent work on Berber ever done by an American. It follows the standard format of other Berber dictionaries and is written in French in order to be used in local schools in Mali.

A typical example is *taHargit 'dream':

- Tahaggart *taharžit*, Tawallemmet *targət*, Tayrt *targat*,
- Ghadames *taβaržot*, Augila *taβargat*, Ghat *taharžit*,
- Kabyle *targit*, Tachelhit *tiwərga/tiwwargit*, Tamaziɣt *tawargit*, Senhaja *tiwarga*, Tarifit *tirža*, Iznassen *taržit*, Beni Snus *taržayt*, Figig *tiržett*, Timimum *tihžet*, Mẓab *tiržet*, Wargli *tiržet*.

As noted by Kossmann (1999:93), Petite Kabylie *taburigt* has a so-called "prefixed" *bu-*, which is already a clue to the origin of *H. We will see that this is most probably *not* a prefix. Another example that exists in nearly all Berber dialects is the word *iHeḍ 'night': Tahaggart *éhoḍ*, Ghadames *éβaḍ*, Augila *aβoṭ*, Ghat *iheḍ*, Siwa *iṭ*, etc.

On that basis, Prasse hypothesized a proto-phoneme *H, more or less explicitly following the model of Indo-European laryngeals. To be precise, in the original article, Prasse (1959) distinguished between *h_1, *h_2 and *h_3: *h_1 does not have any explicit traces in any Berber dialect and is most probably *ʔ, *h_2 is the proto-phoneme *H discussed in the article, *h_3 is not inherited and exists in loanwords. This phoneme *H is therefore considered to be some kind of phonetic *throaty fricative* as implicitly suggested by the symbol H. Of course, this correspondence has nothing to do with *b or *w which are regularly attested as /b/ or /w/. For that matter, the labial identification of *H as being the same phoneme as *b proposed by Rössler (1964) is not acceptable. Basset (1952:7) proposed that *H was the same phoneme as *w, which is equally impossible. Kossmann (1999:132) has added another possibility of a complex sound like */γ^w/, somehow equivalent to one of the possible interpretations of PIE *H_3. Takács (2000:346) made a similar suggestion: "Ghadames b̲ can just as well be a secondary development from an earlier Brb. *h, perhaps via a labialized *h^w."[4] The idea that Proto-Berber could have at least one throaty fricative seems acceptable at first look as "Afrasian" definitely had several such sounds and Berber seems to have kept none. As first sight it seems reasonable to think that the fricative /h/ found in Tahaggart could indeed be a trace of the lost laryngeals of "Afrasian". We will see that this idea conflicts with at least two major sets of evidence: the phonetic changes undergone by "Afrasian" laryngeals and the features of *H.

As mentioned by Allan Bomhard (2008:150): "Another significant characteristic [of "Proto-Afrasian"] is the presence of a glottal stop, a voiceless laryngeal fricative, and voiced and voiceless pharyngeal fricatives." and (2008:169) "at the present time, only *ʔ, *h, *ḥ, *ʕ can be firmly established for Proto-Afrasian." There is no solid basis for velar fricatives *x and *γ. As mentioned before, we agree that *ʔ seems to have entirely muted out in Berber dialects. It remains to be determined to which extent this phoneme has left traces on neighboring vowels, as regards length and color. The other three laryngeal and pharyngeal fricatives have not muted out but become palatalized as shown below: ṣ

Proto-phoneme	Traditional hypothesis	According to me	Kabyle	Tawellemmet
*ʔ	Ø[5]	Ø	Ø	Ø

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[4] Kossmann and Takács do not mention PIE, this is my personal interpretation. It can also be noted that Takács does not provide any explanation how such a phoneme as *h could "spontaneously" develop a labialized feature.

[5] This can be equated with Prasse *h_1.

*h	Ø	*z	z	z
*z	*z	*z	z	z
*ʕ	Ø	*ź	ž	^{E}ẓ
*ḥ	Ø	*ś	s	^{E}ṣ
*s	*s	*s	s	s

The <^{E}> of Tawellemet indicates the general emphatic spread triggered by the presence of one emphatic sound on the whole consonantal skeleton. The traditional hypothesis is described in Bomhard (2008:170), Takács (2000:346) for example. A consequence of our discovery is that all hypothesized "correspondences" between Touareg /h/ and any "Afrasian" *H are to be discarded and that the Berber proto-phoneme written with *H cannot be a throaty fricative. Another phonetic reconstruction must be found for this proto-phoneme. We will show that several independent clues all indicate that *H was the emphatic labial *ḅ. It can be noted that all inherited emphatics in (Proto-)
Berber are voiced which is coherent with a pharyngeal place of articulation in Proto-Berber.

Searching Lexical Evidence For *H

In order to determine the original value of *H in Proto-Berber with the necessary accuracy, one has first to establish a relevant set of Berber words with the highest chances of being inherited. This proto-phoneme has been detected in Touareg but this obviously does not mean that all Touareg words with /h/ in Tahaggart are inherited. These words must first be compared with other branches of Berber, namely with Northern Berber and Eastern Berber. Only the words present in preferably all three branches are relevant. For that matter, the first step is to cull out Touareg words most susceptible to be loanwords. Likewise, Berber words with potential connections in other "Afrasian" languages should be preferred to words of unknown origin.

Kossmann (1999) is worth reading on the issue of *H, especially for the Touareg examples and the internal analysis of other Berber dialects.But I reached different conclusions out of the proposed lexical materials. Kossmann lists the words which have /h/ in Tahaggart. This is indeed the place to start from. But I have found two problems with the items listed. Some of them which are supposed to exist in Touareg cannot be found in the thick dictionaries compiled by Prasse, even though they seem to represent a near exhaustive description of the vocabulary of Touareg dialects. Another problem is that several items listed by Kossmann (1999) are not acceptable because they can be identified to be recent loanwords from neighboring languages. For example, the following Touareg words must be removed from the relevant data. It is quite obvious that Berber words with a *triliteral* root identical to Arabic words are most probably a loanwords from Arabic:

- *tadHent* 'grease, fat', *edHen* 'to grease, oil' < Semitic *duhn 'gras',[6]
- *eHey/iwi* 'to be born' < Semitic *hay 'to live',
- *tuHe* '(camel) hump' < Arabic *taḥədbunt* 'hump',
- *taHeyna*[7] 'tooth-gum' < PAA *ṭaḥin 'tooth' attested in Chadic and Semitic,

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[6] Also listed erroneously as a cognate in Takács (2000:340).
[7] Cf. Ghat (Libya) *tanya* (with metathesis).

Many items which are found only in Tahaggart or Touareg dialects are in fact borrowed from Chadic languages. In these words, /h/ represents a recent adaptation of Chadic "laryngeals" and have nothing to do with the issue of the proto-phoneme *H. Examples of h-words attested *only in Touareg* are:

- *egHen* [8] (Touareg only) 'troup of plunderers', Cf. Chadic *haʔ 'to take, seize',
- *agreH* (Touareg only) 'to see, perceive', Cf. PAA *giʕur 'to see' attested in Chadic and Cushitic,
- *aHeɣ*[9] (Touareg only) 'to make a razzia, plunder', Cf. Chadic *haʔ 'to take, seize',
- *eHan* (Touareg only) 'tent', Cf. PAA *haʔom 'tent, room' attested in Chadic and Cushitic,
- *eHere* (Touareg only) '(young) cattle', Cf. Chadic *birk 'young bovine',
- *Harag* (Touareg only) 'to be neighbor', Cf. PAA *ʕar 'near' attested in Egyptian and Chadic,
- *aHešek*[10] (Touareg only) 'vegetal, tree', Cf. Chadic *busi 'plant',
- *emHel* (Touareg only) 'to push, to force to move', Cf. Chadic *□am 'to move forward',
- *anHel* [11] (Touareg only) 'ostrich', Cf. maybe PAA *ʔa-bin 'bird',
- *aHaya*(*w*) (Touareg only) 'grand-son', Cf. PAA *ḥiwan 'son, child' attested in West Chadic: Cagu *ḥiyn* or Geji *ʔyeŋ*,

Some words are found only in Touareg. We have not been able to trace them to other languages but we tend to think they are probable loanwords:

- *eHegif* (Touareg only) 'sand dune with some vegetation',
- *aHeleḍ liḍ* [12] (Touareg only) 'new bud', Cf. maybe PAA *piraḫ 'bud, flower, sprout',
- *Harwa* (Touareg only) 'still, yet', Cf. Tayrt *arٖwa* with a phonotactic emphatic,
- *aHeyas*[13] (Touareg only) 'camel saddle',
- *amHes* (Touareg only) 'to give (as a compensation for a previous gift)'
- *asHan* (Touareg only) or *azHan* 'palm fiber, stuffing', Ghadames *azβan*, Augila *ižβin,*

Some examples attested in Touareg and Libyan Berber suggest that Libyan Berber has replaced the phoneme *h by *β in some wanderworts:

- *agerH* 'shield', Cf. PAA *qarʕ attested in Egyptian and Chadic,
- *aHales* 'man', Cf. Chadic *ɣula and PAA *ɣulu(m) 'young man',
- *irHan* 'to be sick, ill', Cf. Chadic *laḫ,
- *taraHut* 'noon-time', Cf. Chadic *laʕ 'sun, bright day-light',

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[8] Cf. *aHeɣ* 'to make a razzia, plunder'.

[9] Ghadames *aβeʕ* 'to take'. Cf. Northern Berber *aɣ 'to take', which seems to be another root.

[10] This form displays /š/, which cannot be inherited.

[11] Cf. *enHir* 'mohor antilope' with the same extra *-n-*.

[12] Cf. (Prasse, 2003) Tayrt *halhal* 'to be green, grassy'.

[13] This type of saddle is of Kunta origin, according to Prasse (2003).

Words which are listed in Kossmann (1999) as Touareg but which cannot be found in Prasse (2003) includes the following items. We tend to think that these items of *unverifiable origin* are better kept out of the discussion:

- *agurH* (Touareg only?) 'castrated animal',
- *aHedal* (Touareg only?) 'cheetah',
- *eHedel* (Touareg only?) 'young calf',
- *aHellelu* (Touareg only?) 'butterfly', Cf. PAA *bil(bil) 'butterfly',
- *aHattin* (Touareg only?) 'huge leather-made bottle',
- *aHetes* (Touareg only?) 'kind of acacia, gao-tree',
- *aleH* (Touareg only?) 'to look alike, ressemble',

Some words listed display a phonetic correspondence which does not fit the pattern of *H:

- *taHakimt* [14] (Touareg only) 'half-mattress under a camel saddle',
- *MeHellaw* (Touareg only) 'the Milky way', Cf. Tawellemmet *Madəl* et Tayrt *Malle*,
- *anHi* (Touareg only) 'proverb', Cf. Tawellemmet *anhi* but Tayrt *ayni*. Cf. probably PAA *hay or *ʔan 'to speak, talk',

Additional examples of Touareg *h with counterparts in northern Berber are :

- *aγeH*[15] 'milk', Augila *aγəβ* 'milk' ; Northern Berber *aγu/aγi 'whey',
- *teHedde* [16] 'size, height', Northern Berber *tiddi,
- *iHerinen* 'poison', Ghadames *βareran*, Tawellemmet and Tayrt have /ṛ/ in *eṛaynan*, Cf. Wargli *irirən* (pl.) 'venom',
- *teẓaHet* 'nine' (feminine case), Cf. Wargli *təṣṣ*,

Additional examples of Touareg *h with counterparts in Libyan Berber (Ghat, Ghadames, Augila) are:

- *elkeH* (Touareg only ?) [17] 'to contempt', Cf. Arabic *qabaḥ* 'to hate, abhor'(?),
- *enHeg* 'to be naive',
- *inHal* 'to be easy',
- *aHw* 'smoke', Ghadames *tanaβott* 'roof hole', Middle Atlas *tinnibba* 'chimney',
- *tiHay* 'darkness',

These items are hard to use as they do not seem to have any clear counterpart outside Berber.

Evidence For The Phonetic Nature Of *H

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[14] (Prasse, 2003) cites Tawellemmet and Tayrt *taḥəmkit* avec *ḥ* 'demi-matelassure d'un bât de chameau'. This word may have some connections with *ehaket* 'tent made with skins'.

[15] The relationship with Ghadames *yaff* 'milk' is obscure. Zenaga has *iʔž* 'milk'.

[16] Not attested in Prasse (2003).

[17] The putative cognate word proposed in Ghadames means 'to remain silent'.

*(1) The phonotaxis of *b with laryngeals in inherited and borrowed words*

A first clue to the phonetic nature of Berber *H is that the contact of *b with "laryngeals" generates Berber *H and Tahaggart /h/:

- *bubbeH*[18] (H < ʕ-b) 'to bear on the back', Cf. Chawi *ʕebba* and Zenaga *ežbemi* with palatalisation of *ʕ,
- *teHunt* (H < ʔ-b) 'big stone, grinding stone', Ghadames *oβənt*, Kabyle *tawent*, Cf. Semitic *ʔabn 'stone',
- *teHeyne* (H < b-ḥ)[19] 'date', Ghadames *aβena*, Northern Berber *tiyni (coll.) 'dates',
- *aHeγu* [20] (H < b-γ) 'one-year calf, young bull', Cf. Nefusa *bγu* 'calf', a variant is *aHug* 'foal',
- *aHar* (H < b-h) 'lion', Ghadames *aβor*, Zenaga *waʔr*, Mẓab *war*, Tahaggart *ahar*. Cf. Senhaja *buharu* 'lion, monster',
- *aHara* [21] (H < b-ḥ) 'salt, natron', Zenaga *terert* 'salt', Cf. PAA *baḥr 'sea',
- *enHir* [22] (H < b-ʔ) 'mohor antilope', Cf. PAA *baʔray 'antilope', attested in Chadic and Cushitic.
- *enHey* (H < b-ʔ) 'to see', Cf. PAA *biʔan 'to see, understand',

It is not clear if all these words can be considered inherited or not, but they have been present in the Berber dialects early enough to display the typical phonetic changes entailed by *H. Another possible example attested only in Touareg is *teHit* '(small) wasp', which reminds one of PIE *b^{h}eH 'bee'. It can be noted that obvious or potential loanwords display the same phenomenon:

- *esaHet* (H < b-ʕ) 'seven' (feminine form) < Semitic loanword of *sabʕ 'seven',
- *aHaldom* [23] (H < *ḅ or *ṗ) 'lead, tin', Ghat *ahellum*, Cf. Mẓab, Wargli *buldun* 'lead' (with #b-); other northern dialects have *aldun (without #b-); Zenaga *aldun*. Whatever the exact origin of this word is, all languages, Berber, Greek or Latin, agree that the initial consonant must have been some kind of labial stop, different from *p, *b or *m.

Another item, which is not attested in Touareg, is the word 'onion' most probably of Punic origin **bəẓalim* (Plural form) whence Augila *bẓalim*, Tachelhit *aẓelim*, Wargli *ẓalim* and Mẓab

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[18] Cited in Kossmann (1999) and attested in Prasse (2003) as *băbbu*.

[19] Cf. Wargli *tabḥalit* 'kind of date', which cannot be inherited but indicates the original structure of the word.

[20] Kossmann (1999) missed the connection with Nefusa.

[21] This item is found only in Touareg. There seems to be no lexical trace of it elsewhere.

[22] Also attested in Tachelhit *anir* 'mohor antilope' and Zenaga *enaʔr* (with ʔ). These two words may be loanwords from Touareg. It is unclear why the word has an extra -n-. Cf. the word *anHel* (Touareg only) 'ostrich'.

[23] The final -m reminds one of Latin *plumbum*. Cf. Ernoult-Meillet (1932:744) 'Sans doute emprunté comme grec *molubdos*, *molibos*, *bolimos* dans plusieurs parlers doriens, etc., à une langue méditerranéenne (Ibère ? le plomb venait d'Espagne) ; le genre neutre est caractéristique des noms de métaux en latin.' Cf. Mycenian Greek [mo-ri-wo-do].

ẓalim. This item is virtually equivalent to a pseudo-Proto-Berber *aHẓalim. The items of Latin and Punic origin suggest that the emphatic labial *ḅ still existed in Berber dialects two thousand years ago.

Touareg examples not attested in Libyan Berber are more difficult to handle because the traces of *H in northern Berber are very limited. Another possible item of *H of phonotactical origin is:

- *abilHeṭṭ* [24] (H < ʕ-b) 'eye-lid', a reduplicated root *ʕabil-b-eṭṭ, Cf. Kabyle *ibəl*, Senhaja, Chenoua, Menacer, Mẓab, Wargli *abəl* 'eye-lash'. Cf. Hebrew *ʕapʕappayim* 'eye-lashes, eye-lids' for the same kind of reduplication for this root.

*(2) The phonotaxis of *b with emphatics*

In some cases, the triggering phoneme is not a "laryngeal" but another emphatic:

- *eHaḍ* (H < b-ḍ) 'night', Cf. Ghadames *êβaḍ*, *iβeḍ*, Foqaha *ayyaḍ*, Cf. Chadic *baḍi with *b,
- *enḍaHeḍ* 'the other night, yesterday evening', Cf. Nefusa *iḍ-ennaṭ* 'yesterday', Tawellemmet, Tayrt *ahaḍ-naḍ* 'the day before yesterday'. A complex derivative of **eHaḍ*,
- *tanHaṭṭ* [25] (H < b-ḍ) 'decision', Cf. Tamaziɣt *nbəḍ* 'to command, decide'.

*(3) The phonotaxis of *w with laryngeals*

Some items do not involve *b but *w:

- *aḍHan* (H < w) 'very strong man', Cf. PAA *dawn 'strong' attested in Chadic,
- *eḍHer* (H < w) 'to be proud', Cf. *aḍHan* (?),
- *Heḍeḍi* (H < w) 'to be inflated', Cf. Tawellemmet and Tayrt ^{E}*əwəḍ*,
- *agdeH* (H < w) 'to be equal' ; *egdeH* 'to be enough', Cf. Tawellemmet and Tayrt *awəḍ* 'to reach (a place)'. The meanings in Tahaggart seem to be derived from the concrete meaning 'to reach (a place)'. Cf. PAA *waʕad ou *ʕadaw 'to go',
- *enHeḍ* (H < w) 'craftsman, smith', Tachelhit *anuḍ* 'workshop', Cf. Chadic *ʔanaw 'to work',
- *elH* 'to weep', Augila *eβel*, Cf. PAA *wal 'to weep' attested in Chadic,
- *teHəle* (H < w) 'ewe', Cf. PAA *waʕil 'ovine, caprine',
- *erH* or *eHr* (H < w) 'to love, desire', Ghadames *ëβr*, Cf. PAA *walaʕ attested in Semitic and Chadic,

These items suggest the following sequence of events in Berber:

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[24] Cited in Kossmann (1999) but I have not found this word in (Prasse, 2003).
[25] Not attested in Prasse (2003).

- The inherited glottalized labial stop *pʔ becomes the voiced emphatic *bʕ,
- The emphatic stop *ḅ becomes an emphatic spirant *ẉ, which is kept as such in Libyan Berber,
- In Touareg, the emphatic spirant *ẉ becomes a laryngeal fricative *h,
- In northern Berber, the emphatic spirant *ẉ tends to mute out, except in non Zenati dialects.

*(4) Developments of *b similar to those of *H*

Some items seem to originate in a labial stop without any contact with a "laryngeal", emphatic or any potential triggering feature. It is possible that to some extent in word-final position, the contrast between *b and *H was neutralized and only *H appeared in that position:

- *eH* (H < b) 'to be inside', Cf. Semitic *bi 'in', *bîn 'among',
- *taḤurt 'door', Ghadames *taββurt*, Augila *teβurt*, Tahaggart *tahort*, Kabyle *tabburt*, Cf. Semitic *bab*,
- *eddeH* (H < b) 'to pestle, crush', Ghadames *addëβ*, Cf. Tawellemmet and Tayrt *dabdab* 'to hit something to make it flat and even'. Cf. Arabic *dabal* 'to strike repeatedly with a rod',
- *ulH* (H < b) 'heart', Cf. Semitic *l_b 'hear', Egyptian *jb* 'heart',[26]
- *temadHe* (T < b) 'termite', Cf. Timimum *timdi* 'termite', Siwa *tamdi* 'ant'. PAA *dab 'termite' attested in Semitic and Chadic,
- *enHer* (H < b) 'eye-brow, eye-lash', Ghadames *anβar*, Cf. possibly Arabic *nabâtât* 'beard, face-hair',
- *areH* (H < b) 'to write', Cf. Hausa *rubuta* 'to write', Kabyle *aru*, Ghadames *ôrəβ*,
- *azeH* (H < b) 'to peel, to skin', Ghadames *ôzəβ*, Kabyle, Tachelhit *azu* 'to skin', Tachelhit *azzaw* '(act of) skinning'. Cf. Arabic *zabaq* 'to remove the hair, the features (of an animal)',

Some additional evidence is provided by words which are potential loanwords with labials:

- *aHarn 'flour', Ghadames *aβarn*, Augila *βrun*, Kabyle *awren*, Siwa *aren*, Mẓab *wiren*, etc. The connection with Latin *farina* is fairly obvious, all the more so as the word is not attested in Touareg. The loanword has been considered dubious by Schuchardt (1918) and Kossmann does not accept it either. We tend to disagree with this negative conclusion,
- Ghadames *aβrəg* 'to grind', Kabyle *bri*, Tachelhit *bri*, Middle Atlas *brey*, Mẓab *bṛuṛi*, Wargli *bruri*, Chawi *bri*. Cf. Latin *frio*, *frango*,
- Ghadames *azβeḍ* 'to measure', Augila *žβaṭ* 'to weigh (cereals)', Tarifit, Mẓab, Wargli, Metmata *iḍeḍ* 'to weigh', Ghat *aḍeḍ* 'bushel, measure used for grains'. Cf. Latin

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[26] Cf. Also Takács (2000:339) for "Afrasian" additional data. As regards this word, Takács (2000) makes the completely unacceptable hypothesis that "Afrasian" *b > *H in Berber. Moreover he contradicts himself on the next page and compares Tahaggart *tahabbat* 'hole' with Arabic *habba* 'to pierce' and Egyptian *whb* 'to bore'. Why should *b be retained in that word if *b > h in Tahaggart?

pe(n)so, pe(n)sito 'to weigh'. Kossmann (1999:119) considers that a metathesis happened *ezHeḍ ~ *eHzeḍ, which makes the connection even clearer,

- *abaw, *ibiw, *aHaw 'broad bean', Ghadames *ababba*, Augila *βiw*, Ghat *ababaw*, Kabyle *ibiw*, Siwa *awaw*, etc. This word has long been recognized as a potential loanword of Latin *faba.* It is unclear if Touareg *abawbaw* 'nut, almond' belongs here, we tend to think it does not,
- *aHarg 'beam, wood-rod', Ghadames *aβarg* 'beam', Augila *aβerg* 'pestle', Kabyle *aberg, ibergen* 'wood-rod, a part of the mill that is used to create coucous dishes'. This technical word with a limited extension looks like a loanword of Latin *fulcrum,*
- *aHennas 'lock, bolt', Ghadames *aβannas* 'lock-bolt', Wargli *annas* 'lock'. Cf. speculatively Latin *pessulus* and Greek *passalos.*

*(5) Same allomorphs for *H as the other labials*

An important clue that *H must be a kind of labial is the very subtle fact that the prefix #m- has an allomorph #n- when the roots already contain a labial. Thus in Kabyle, one finds *rnu* 'to add' and *nn-erni* 'to grow'. This is coherent with Tahaggart *erneH* and Ghadames *arnəβ* 'to add'. The final *-u* of Kabyle is not part of a vocalic scheme but the reflex of a more ancient labial phoneme.

(6) Archaic aorist shape aCu in non Zenati Berber

A third clue and set of evidence for *H is the peculiar aorist of the *aCu* ou *CCu* shape with a final *-u,* when all other verbs have *-i*. It can be noted that only Kabyle and Tachelhit exhibit the preservation of this feature. In the Zenati group, the verbs have been transfered into the *-i* shape paradigm:

- *aḍeH* (H < ḥ-b) 'to bend', Tahaggart *aḍ*, Tachelhit *aḍu* (conjugation of the *aCu* type). Cf. PAA. *dab 'to bend' attested in Semitic *ḥidab and Chadic *diḥab [27],
- *ekleH* (unknown origin) 'to decorate', Ghadames *akləβ,* Tachelhit *klu,*
- *erkeH* (unknown origin) 'to be rotten', Cf. Kabyle *ərku,*
- *erneH* (unknown origin) 'to add', Ghadames *arnəβ,* Kabyle *rnu,* Zenati Berber *rni,*

Most northern dialects, those of the Zenati group, have the verb ending *-i,* but Kabyle and Tachelhit (still) have *-u*. From our point of view, where *H is /ḅ/, this is a remarkable archaism. In the other approach, where *H is supposed to be a "laryngeal", this feature requires an ad-hoc transfer which nothing motivates. For example, here is what Kossmann (1999:91) says:

> "Pour le kabyle et le tachelhit, il est difficile de décider sur la question des correspondances de *eĤ final par le fait que les verbes à dernière radicale Ĥ ont été introduits[28] dans les classes à voyelle finale du type : aoriste u, prétérit i/a."

Some items with the u-aorist exist only in northern Berber and are not attested in Touareg. It is unclear to which extent they can be accepted as examples of *H:

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[27] Chadic seems to have the form which best fits Berber.

[28] Kossmann also uses the word *transféré.*

- *egneH ‘to sew’, Tachelhit, Tamaziγt *gnu*, Cf. PAA *ḳ_n_w ‘to bind, knit, weave’,
- *eqqeH ‘to copulate’, Cf. Arabic *qabaṣ* ‘to fecondate the female’, *qibirra* ‘glans’,
- *ežžeH ‘to smell good’, Izdeg, Tachelhit *žžu*, Seghrouchen *žey*,

(7) Morphological alternation in the intensive form

A fourth clue is the morphonological alternations found in some verbs. Two types exist: *f* ~ *Ø* and *b* ~ *Ø*. In Tachelhit, three verbs display the following pattern between the aorist and the intensive:

- ‘to spread’: *fsr* ~ *assr* < *əpsər ~ *Hassər
- ‘to open (buds)’: *fsu* ~ *assu* < *əpsəw ~ *Hassəw
- ‘to give’: *fk* ~ *akk* < *əpkə* ~ *Hakkə*

This alternation can be explained if the vocalic scheme in Proto-Berber was: eHC_1eC_2 ~ $HeC_1C_1eC_2$. When followed by a voiceless consonant, H got assimilated and became voiceless : *ḅ > *p > modern /f/.

The same phenomenon can be found in Kabyle with voiced phonemes. The intensive is not built in the same way as in Tachelhit but the same alternation is found:

- ‘to be standing’: *bded* ~ *ttadded* < *əbdəd ~ *tHaddəd
- ‘to declare’ : *bder* ~ *ttader* < *əbdər ~ *tHaddər
- ‘to put on a belt’ : *bges* ~ *ttages* < *əbgəs ~ *tHagəs. Cf. Tachelhit,
- ‘to get wet’: *bzeg* ~ *ttazeg* < *əbzəg ~ *tHazəg

Tachelhit also has examples of this alternation:

- ‘to share’: *bḍu* ~ *aṭṭa*
- ‘to bore’: *bgu* ~ *agga*
- ‘to mention’: *bdr* ~ *addra*
- ‘to be inflated’: *bzg* ~ *azzg*
- ‘to put on a belt’: *bks* ~ *aggs*, Cf. Kabyle,
- ‘to begin’: *bdu* ~ *adda*.

In other words: when followed by a voiced consonant, H assimilates to *b*, when followed by an emphatic, *p assimilates to H. It is obvious that only *pʔ or *bʕ can be coherent with that pattern.

Conclusion

I have investigated the set of Touareg words which exhibit /h/ and support the existence of a *H phoneme in Proto-Berber. Several convergent clues show that this proto-phoneme *H cannot have been a throaty fricative of any kind but must have a labial stop, which is best identified with *ḅ < “Afrasian” *pʔ. This discovery is a new break-through in the understanding of Berber in relationship with the other “Afrasian” languages in general.

This conclusion is coherent with another discovery that the "Afrasian" gutturals have become palatalized in Berber.

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In Memory of Daniel F. McCall

Comments on the article "What Does the Berber Proto-phoneme *H Stand for? " *by Arnaud Fournet*

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The author discovers what has been discovered for a long time and with better argumentation. Simply put, *h* in some Berber etyma is derivable from a labial sound (including the cluster of labial+laryngeal), but there are also other *h* originating from primary 'laryngeals' with guttural articulation, besides the specific fate of Berber **z* > Tuareg of Ahaggar *h*. The following serious studies are missing from his bibliography:

Beguinot, F. 1924. "Sul trattamento delle consonanti *b, v, f* in berbero." *Rendiconti della R. Accademia Nazionale dei Lincei (classe di scienze morali, storique e filologiche),* Série 5 no. 33, 186-199. [The first serious study devoted to this problem.]

Militarev, Aleksander, "Istoričeskaja fonetika i leksika livijsko-guančskix jazykov," in: *Jazyki Azii i Afriki*, IV.2: *Kušitskie jazyki. Livijsko-guančskie jazyki. Egipetskij jazyk. Čadskie jazyki*. Moskva: Nauka 1991, 238-267. [Militarev writes on Berber **ḅ* > Ghadames *ḇ*, Augila *v*, Tuareg *h/Ø*, North Berber *w/Ø* especially on pp. 239, 244. He deems that **ḅ* is a positional variant of Berber **b* with secondary glottalisation in neighborhood of Berber labialized *q^{w}, *H^{w}, *h^{w}, and non-labialized *' and **h*.]

Rössler, Otto. 1942. "Lybica." *WZKM* 49: 283-311. [On pp. 290-94 he included the Numidian data with *b* (the etymon "write") supporting the labial archiphoneme reflected by the correspondence of Ghadames *ḇ* vs. Tuareg *h*.]

Vycichl, Werner, 1991: "Die pharyngalen Laute ***'Ayin*** und ***Ḥā'*** im Berberischen." In: *Komparative Afrikanistik* (Gs. H.G. Mukarovsky), hrsg. E. Ebermann, E.R. Sommerauer & K.É. Thomanek. Wien: Afro-Pub, 383-86. [He demonstrates that the Berber reflex of AA *^{C} and **ḥ* is **y*.]

It is generally accepted that Berber **γ* corresponds to Semitic and Egyptian **q* and **ḫ* (see Takács, Gábor. 1999. *Etymological Dictionary of Egyptian*, Vol. I: *A Phonological Introduction*, Leiden: Brill, p. 271).

It is rather audacious to conclude that there is no internal and external dictionary of Egyptian and Coptic on which comparative studies could rely, in the face of the existence of three volumes of *Etymological Dictionary of Egyptian* by Takács, and his numerous studies devoted to this topic, not to mention *Dictionnaire étymologique de la langue copte*, Leuven: Peeters 1983, by Werner Vycichl.

Again the formulation “Considering the current real status of these three basic branches of ‘Afrasian’, it makes little sense to talk about items like Omotic or Chadic” is a witness to the ignorance of the author concerning the series of serious studies by Paul Newman, Russell Schuh, Henry Tourneux, Ekkehard Wolff, Olga Stolbova, Gabor Takács and others in the field of the Chadic reconstruction. The state-of-the-art of Omotic reconstruction, including external comparisons (and including Berber-Omotic comparisons!) is summarized in the monograph article of V. Blažek, “A lexicostatistical comparison of Omotic languages,” in: *In Hot Pursuit of Language in Prehistory. Essays in the four fields of anthropology*, ed. by J. D. Bengtson, pp. 57-148. Amsterdam/Philadelphia: Benjamins. 2008.

The AA dictionary of Orel & Stolbova is NOT a source of serious AA etymologies and reconstructions, and even worse is the dictionary of Ehret (1995) with his creative approach to semantics.

In his lexical comparisons the author does not respect the generally established sound laws, e.g. Berber **l* ~ Semitic **l* ~ East Cushitic **l* ~ Chadic **l*, and Berber **r* ~ Semitic **r* ~ East Cushitic **r* ~ Common Chadic **r* ~ Egyptian *r/3/j*.

This can be demonstrated, for example, on the basis of an incorrect *r* ~ *l* comparison:

The author compares Tuareg (exactly Taneslemt) *ərH* ‘to love, desire’ and Ghadames *ëβr* with AA **walaʕ* attested in Semitic and Chadic (so Orel & Stolbova). But there is much better comparison first proposed by Rössler (1964, 213; see also Prasse 1969, 27): Egyptian *3bj* "to desire, wish for" ||| East Cushitic: Somali *rabayya* "to wish" ||| West Chadic: Sura *rə̀bɛ̀t* "to desire, love", Mupun *rə̀bə̀t* "to like" (Takács 2000, 340, 5.9.).

Tuareg of Ahaggar *teHit* "wasp" is the feminine of *êhi* "fly". The closest cognates confirm original **z*: Awlemmiden *izi*, Ayr *izi*, Ghat *izi, izzi*, further Kabyle *izi* etc. "fly" (Prasse 1969, 43, #117).

Summing up, although the solution of author is acceptable as a result of one of more parallel processes (hence not the ONLY solution), his text brings nothing new, the argumentation is both incomplete and too categorical, based on frequently doubtful etymological material. The author is not at all oriented in modern trends of Afroasiatic etymology.

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It is rare to read about Berber historical phonology, and what has been written (including my own contributions) is far from definitive. Therefore it is good that people take a fresh look at it. For the same reason, I am quite disappointed with the article above. I shall first make a point of methodology, and then go on with the main theses of the author.

The point of methodology is the following: it is ridiculous to claim that group-internal reconstruction is not necessary when you are dealing with "just" dialects. Dialectal differentiation in Berber is similar to that in Germanic or Romance, and I do not think anybody would want to base a phonological reconstruction of Romance on modern Spanish only. The choice of the author just to base himself on one single dialect has lead to one of the major flaws in his argumentation. In the beginning of the article he compares the Tuareg data in Kossmann (1999) to the data provided by Prasse e.a. (2003). Those data not found in this major dictionary were discarded. However, Prasse e.a. (2003) is a dictionary of Niger Tuareg only (did the author miss this?). As already shown by Prasse in 1969, and as repeated by Kossmann (1999), Niger Tuareg is the least conservative variety of Tuareg as regards *h*. If the author had taken a look at Heath's (2005) dictionary of Mali Tuareg (which he cites in the article, but does not use), he would have found many – if not all - of the discarded forms. The suggestion that all forms not present in Prasse et al. (2003) are a kind of ghost words is therefore false (and, as the attestations in Kossmann 1999 are fully referenced, very strange from the start).

So what are the main issues in the article. In the first place, the author argues for a reconstruction of Tuareg *h as a bilabial sound. In order to do so, he closely follows my own argumentation (mostly without citing), sometimes without understanding the argument. The whole idea is not very new; it was already proposed by Francesco Beguinot in the 1920s, taken up by Otto Rössler in the 1950s, and, finally, worked out on a broader internal Berber comparative basis by myself in 1999. Strangely, the author thinks he is original here, and attacks my reconstruction of *h as *γ^w. I fully agree that this reconstruction is without any basis, and… I never proposed it. In my concluding paragraph (Kossmann 1999:132) I say "il est clair que la reconstruction *β explique mieux les règles d'assimilation qu'a subies *H (better than a reconstruction *h, MK). Il est donc très probable que la prononciation de *H a eu un élément labial (…). Bien entendu, *β n'est pas la seule reconstruction possible ; on peut penser aussi à *h° ou quelque chose de semblable." As is clear from the formulation and from the table in Kossmann (1999:249), I prefer the reconstruction *β.

The second part of his reconstruction is original: according to the author, the labial element would have been glottalized, originally. From the argumentation I infer that this glottalization itself was the effect of the presence of other glottal or glottalized elements in the proto-language.

At this point the corpus problem comes in. The author discards all evidence which does not come from Niger Tuareg, and finds that in the remaining set there are many cases with an emphatic consonant. Although I suppose this is accidental, it might be interesting to see to what extent the presence of an emphatic (pharyngealized) consonant hindered *h*-deletion in Niger-Tuareg. As Niger Tuareg is not even similar to proto-Tuareg when it comes to *h (see above), the relevance of the observation for proto-Berber reconstructions is almost nihil. Moreover, even in the remaining corpus, there are a lot of cases where there is no emphatic consonant in the word. In these cases, the author takes proto-Chadic and proto-Cushitic "evidence" in order to show the presence of a now-lost glottal element. Apparently, the strongly debated reconstruction of proto-Chadic, and the reconstruction of proto-Cushitic, which has hardly begun, are considered more reliable than the low-level reconstructions possible (and available) for proto-Berber. The author does not even cite his sources for the Chadic and Cushitic reconstructions! So in the end, the second part of the argument is based on an arbitrarily trimmed data set (only Niger Tuareg), and compared to very disputable reconstructions of other branches of Afroasiatic (and, it should be reminded, according to the late Sergei Starostin, Afroasiatic has a time depth similar to that of proto-Nostratic).

I fear the only possible impact this article can have is the introduction of a reconstruction *γ^{w}. While Afroasiatic historical linguistics is littered with ghost words, this is the first ghost reconstruction that I am aware of.

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The paragraph "Present Day Hamito-Semitic Studies" contains too many postulations not argued for.

The article bears witness to insufficient knowledge and exploitation of the most recent publications. Thus, to the list of dialects of page 2 could be added the following works:

- Tahaggart: Prasse 2005, Manuel vol. 4, Syntaxe (Cargo-Verlag, Harrassowitz)
- Tawellemmet-Tayert: Prasse 2003, Dictionnaire (Museum Tusculanum Press)
- Taneslemt: Heath 2005-2006 Grammar and Dictionary
- In fact, these two publications primarily are built on Taneslemt-Tensärt and only secondarily on Tadaght
- Ait-Seghroucchen: Bentolila 1981, Grammaire Fonctionnelle

As for the term "Zenati," if a special dialect sub-group can be identified is a matter of debate. Which distinctive features should be assigned to such a group as a whole? The Zenata seem rather to be a sociological group. Thus Elfoqaha (and Awgila) should rather be grouped with Ghadames (or Tuareg??) as a particular group.

Zenaga in particular deserves much more attention. I feel convinced that a deeper evaluation of the nature of its glottal stop (') will bring Fournet to a complete revision of his conclusions. See also Kossmann 2001.

The four Tuareg words excluded for being loanwords can hardly be such:

- $^{\mathrm{H}}$*tadənt*. $^{\mathrm{DN}}$*tadhont* is panBerber (Taš. *tadunt*) and hardly a loanword, but it has probably been associated with *ədhən* < Arabic *dahan, duhn.*
- *əhəy* is unknown to me. WY has *əhəw*. A genealogical relationship with Sem. *HYW* is possible.
- *tuhe* can hardly derive from Ar. *ħadabah* (!) (*taħədbunt* must be Berber).
- $^{\mathrm{DN}}$*tăhayne* (!) cannot derive from *ṭaḥin, as Tu. *tă-* is a stative prefix.

So much for the author's general accuracy. Similar problems characterize the following text, e.g.:

Tu. *eHegip* does not exist. All dialects have *egef* with H_1. Tu. has no *–p-*.

The group of words said (in footnotes 17, 19, 25, 26) not to be found in Prasse (2003) all exist in this dictionary, but of course without the *H* which is only found in Taḍaqq and Tanəsləmt. Contrary to Fournet, these examples are highly relevant for the subject under discussion.

The distinction of *a-ă-ə*, so important in Tuareg, has not been made in this article. Why not give a correct phonetic transcription? Science is sufficiently advanced to allow this today.

It is often unclear whether a form is a reconstruction or a Mali Tuareg form.

The comparisons with extra-Berber languages are carried out at random without any method to warrant their reliability.

I do not think that Dr. Fournet has convincingly proved that **H* derives from **b*. As for Proto-Afrasian, I abstain from commenting on it. It is too speculative for me. My first concern is to create a reliable theory of Proto-Berber.

Response to the Discussants

Arnaud Fournet

I am grateful to Mr. Blažek for the additional bibliography. As regards Beguinot (1924), *classe di scienze morali, storique* [sic] *e filologiche* should be changed to *classe di scienze morali, storiche e filologiche*. As regards Militarev (1991), the hypothesis that *ḅ is a regular allophone of *b in particular environments, like the "neighborhood of Berber labialized *q^w, *H^w, *h^w, and non-labialized *' and *h*," cannot be accepted as one of the clearest and most widespread examples of *ḅ is the word 'dream' *taHargit where H=□ is independent from the supposed conditioning factors proposed by Militarev. As regards Vycichl (1991), I disagree with the idea that the pharyngeals *^{C} and **ḥ* could become *y as I have proposed that the pharyngeals of Proto-Berber have been palatalized as explained in the article.

I agree with Mr. Blažek that my second paragraph contains a number of provocative statements. I nevertheless maintain that I consider the field of Afrasian studies to be immature. The concern expressed by Mr. Prasse about the need of a reliable Proto-Berber actually supports my point of view.

Apparently Maarten Kossmann seems to have tender feelings for ghosts: ghost words, ghost reconstructions. Unfortunately he seems fond of reading ghost arguments as well.

I wonder why he wrote that "it is ridiculous to claim that group-internal reconstruction is not necessary when you are dealing with 'just' dialects". I am not aware that I ever made such a claim in the article so I do not know what to say. Actually K. Prasse blamed me for following the suggestion of a Zenati sub-group...

I am afraid that contrary to what M. Kossmann claims his data are not *at all* "fully referenced," otherwise it would not be necessary to check each word one by one. References in Kossmann (1999) are indeed a problem. It can be noted that most words are cited in the book several times but they never have *any* references *at all* at *any* time.

The statement that "the choice of the author just to base himself on one single dialect has lead to one of the major flaws in his argumentation" or that "the author discards all evidence which does not come from Niger Tuareg" is wondrous: this goes beyond belief in the existence of ghosts and borders on complete hallucination. The article is precisely based on the idea that only the words with the maximal extension should be used. I wrote: "This proto-phoneme has been first detected in Touareg, in Tahaggart to be precise, but this obviously does not mean that all Touareg words with /h/ in Tahaggart are inherited. These words must first be compared with other branches of Berber, namely with Northern Berber and Eastern Berber. Only the words present in preferably all three branches are relevant". I see nothing to add as regards this point.

I did not "attack [M. Kossmann's] reconstruction of *h as *γ^w" or *h^o. I actually wrote that this idea could receive possible support from some suggested reconstructions of PIE *H_3. I am not against this idea a priori and several articles and books of Martinet about PIE phonology hint at this kind of labialized phonemes for *H_3.

I did not write nor suggest that *H < *pʔ was necessarily linked with a neighboring glottalized phoneme. What I provided is several examples where acquired glottalization of plain labials created apparent *H out of *p or *b.

It is also remarkable that M. Kossmann seems to blame me for considering that Proto-Chadic or Proto-Cushitic are supposedly more reliable than Proto-Berber. I recommend a more careful reading of the first paragraph of the article.

I am grateful to Mr. Prasse for additional references. Prasse (2003) is indeed cited in the references but was not mentioned in §2 [this point is emended in the last version]. Bentolila

(1981) is mainly a grammar written in a very specific theoretical framework (Martinet's functional structuralism) and hardly deals with phonological or lexical issues, which are the focus of the article. The exact dialect is Aït-Seghrouchen [only one -c-] (of Oum-Jeniba in Morocco).

As regards the hypothesis that some northern Berber dialects add up to a Zenati subgroup with a genetic relevance, I see no incoherence in a genetic subgroup having sociological features at the same time. It is on the contrary preferable that it should be so. In all cases, the article provides a number of potential isoglosses for such a subgroup. That a Zenati subgroup exists is suggested by several authors. It seems that Mr. Prasse does not accept this hypothesis but does not provide any reason why he seems to oppose the idea.

Following Mr. Prasse's remark that I may have overlooked or misquoted existing data (or cited data already misquoted by other people!), I have checked the references and this is taken into account in the latest version of the article.

As regards Zenaga, its glottal stop and the internal comparanda of this phoneme in other Berber dialects, Taine-Cheikh (2004:185-7) discusses a number of items and remains extremely prudent when it comes to any conclusion. For the time being, Zenaga provides contradictory information as mentioned in the footnote #28. As for Mr. Prasse's personal conviction that Zenaga should lead to a complete revision of my point of view, I tend to think that a better assessment of Zenaga's glottal stop, and similarly of the other phoneme /h/ not mentioned by Mr. Prasse, from the point of view of Zenaga's phonology, morphology and Zenaga's full integration in Berber and Afrasian comparative studies is necessary before any conclusion can be reached in general, and about my own proposals in particular. I tend to think that Zenaga's laryngeal phonemes have undergone complex interferences between phonological and morphological processes, which need to be disentangled. For example, how come that the word 'foot' *avuʔs* has an intruding glottal stop (AA is *(a-)pus)? In all cases, the scanty and contradictory nature of the data is unlikely to bring any clear-cut conclusion, let alone a refutation.

As for a number of items which are often considered inherited by many authors, such as pseudo-Berber ≈tadHunt 'tooth', the premise that they should be considered inherited because they are pan-Berber is clearly refuted by the counter-example of the word ≈aHaldo-m/n 'lead', which is just as widespread as ≈tadunt - from the southwest to the north-west to the east - and obviously borrowed from Latin *plumbum* or maybe directly from the (Iberian?) source of this word. The complete structural identity of ≈tadhunt with the triliteral root - not a Berber typical feature - and the vocalic scheme of Arabic *duhn* is a clear indication that this word is not inherited and therefore irrelevant to the discussion of Proto-Berber *H. And the same conclusion applies to all the words which are not satisfactorily attested outside Tuareg and do not meet minimal criteria to be considered inherited. I maintain that these words are irrelevant to the discussion of Proto-Berber *H as they are not, or at the very least are extremely unlikely to be, of Proto-Berber date in the first place. I disagree with Mr. Prasse's approach, which unduly projects into Proto-Berber a number of detectable loanwords of Chadic and Semitic origin. It seems that our points of view about the status of these words as inherited or borrowed cannot be reconciled and this situation probably accounts for our divergences about the phonetic nature of *H.

As it seems my conclusion - or the abstract - has been misunderstood or misread, I will restate that my proposal is to identify *H with AA *pʔ not with *b as Mr. Prasse erroneously states.

I must emphasize that I share Mr. Prasse's concern of creating a reliable theory of Proto-Berber. I hope that the article may be a useful contribution toward this goal.

I would like to restate that I am honored and grateful that MM. K. Prasse, M. Kossmann and V. Blažek accepted to review, comment on and improve this article.

MOTHER TONGUE
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In Memory of Daniel F. McCall

The myth of rapid linguistic change: Part II
The evidence from Roman military history, Italian dialects, Catalan verbs and palaeodemography

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In MTXIII, I presented evidence by Straka[1], Zink[2] et al. to demonstrate that the major phonological changes between Classical Latin and the modern Romance languages had already occurred well before the fall of the Roman Empire, in some cases, as early as the 1st and 2nd centuries CE. This was corroborated by the evidence from Swadesh lists, which showed that apparent lexical changes were merely an inheritance of a Vulgar Latin vocabulary which already differed from classical Latin and that subsequent borrowing or lexical change was extremely minor.

The innovative feature of this model with regard to those of Zink and Straka was to show that these 'changes' did not represent *in situ* language change so much as the adoption of forms which have been preserved largely unchanged in Italian dialects, notably of Liguria and the Po Valley, Sardinia (which imported forms from the South of Italy) and of Southern Italy itself. This permitted the mapping of dialectal forms of Latin (or regional Italic languages such as Oscan) to the precursors of Spanish, Portuguese, French, Romanian, etc. and hence the description of a process for the spread of Latin which precisely paralleled the spread e.g. of English into North America (where the Tidewater dialect of Virginia can be seen to derive from the West Country 'Zummerzet' accent and most likely was imported mainly by Royalist tobacco farmers who left England in the aftermath of the Civil War (1649), while the settlers of New England have an East Anglian inheritance).

If this model is correct, then it argues for linguistic conservatism and a very different process to a Saussurean view of language as having a natural tendency to change in an arbitrary way. In other words, languages only really change when confronted by a well-defined external stimulus. The extensive invasion and settlement of Northern Gaul by the Franks in the late 5th century CE is thus responsible for the fact that French has undergone much more phonological change than say Italian or Spanish.

The model nevertheless raised a series of questions which this article will attempt to address:

1. If the modern Romance languages are nothing more than the highly conservative descendants of dialectal forms of Latin, is there a demonstrable vector for their spread into Gallia, Hispania, etc.?
2. How do we explain the original generation of this dialectal diversity, given that the varieties of Latin which became the northern dialects of Italian cannot have been more than a few centuries old when they were transmitted to Iberia?
3. The MTXIII article suggested that the major vector for language change was immigration and that there was a critical ratio of immigrants/natives. In this way, the reason that France had not become Germanic speaking was simply due to the fact that there were not enough Goths/Franks and Huns relative to the local population. But was this hypothesis

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[1] G. Straka, *Les sons et les mots*, C. Klincksieck, Paris 1979.
[2] G. Zink, *Phonétique historique du français*, puf, Paris 1986.

robust to apparent counterexamples, such as the displacement of Latin/Celtic by Anglo Saxon, or the spread of Hungarian into Pannonia?

Due to time considerations, I shall defer consideration of a fourth point: whether the conservative nature of the Romance languages is demonstrable for other language families, to a subsequent article.

1. THE EVIDENCE FOR THE SPREAD OF LATIN DIALECTS FROM ROMAN MILITARY HISTORY

In MTXIII, I alluded to very similar forms between Portuguese and Spanish and Northern Italian dialects of Liguria and Emilia. Notably the most bizarre phonological change of all in these languages: *pl-/cl-* > *ch-* (Port.) and *ll-* (Sp.). Hence, *clavis* > *chave/llave*, *plenum* > *cheio/lleno*, etc. We have Ligurian *ćasa* (It. *piazza*-square), *ćü* (It. *più*-more) – cf. Mediaeval Port. *chus*, Genoese *ćöve*, Emiliano *ćöve* and Portuguese *chove*, (It. *piove* – it's raining) – Port. *chove, ćén* (full) cf. Port. *cheio*. These forms also appear in Sicilian dialects but these probably date from the Gallo-Italian colonisation of the 12th and 13th century. I also suggested that *mãe/pai* in Portuguese was more likely to be a sibling of *moae/poae* in Genoese (presumably a Celtic/Ligurian inheritance) than a derivative of Classical Latin *mater/pater*, with these two examples evidently being mutually reinforcing.

We clearly have no systematic census data to shed light on such movements, and I initially assumed that the forms had been spread in the very early Roman empire and then 'fixed' by the economic crisis and civil war of 235-285 and then by Diocletian's reforms.

A fruitful approach nevertheless appeared to lie in an investigation of the composition of the Roman legions in order to discover whether any correlations could be drawn between the ethnic origins of soldiers and the establishment of dialectal forms. While there were evidently other groups moving around the Empire, such as farmers, traders and internal refugees, it seemed reasonable to assume that the closer one moved to frontier regions where a military presence was needed to control unruly or hostile tribes (even within the empire), the more likely it was that the military element would be the dominant influence on language development.

This is particularly true of Hispania, where Roman settlement under Augustus was overwhelmingly concentrated in Baetica[3] (along the Guadalquivir) and to a lesser degree along the Ebro, with virtually no new settlement in Northern Portugal/Galicia/León.[4]

The study of the ethnic composition of the Roman legions under the empire begins with Theodor Mommsen,[5] who first drew up lists of the recruiting areas for soldiers, postulating that legions in the East and West tended to recruit in mutually exclusive fashion and that there were several distinct periods of behaviour under Vespasian, Hadrian and Septimius Severus. The definitive scholar of this aspect is nevertheless Giovanni Forni,[6] with some later contributions by the French military historian, Yann Le Bohec.[7] These latter studies confirm the regionalisation of recruitment, giving detailed information on the legions in Spain and Egypt. Forni nevertheless highlighted that recruitment behaviour did not change radically with each new emperor, but that traditions did develop (e.g. as a forerunner to the French foreign legion, soldiers from Gallia Narbonensis apparently preferred to serve in Africa).

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[3] Cf. Macmullen, R., *Romanization in the time of Augustus*, Yale University Press, 2000, pp. 52-53.

[4] Although the same analysis can doubtless be performed for Roman Gaul, where there was a massive concentration of settlement in the lower Rhone Valley, some settlement in Northern Gaul (Artois) and little settlement elsewhere. *Idem*, p. 94.

[5] Th. Mommsen, *Ephemeris Epigraphica*, 5, 1884, pp. 159-249

[6] G. Forni, *Il reclutamento delle legioni* cited in *Estrazione etnica e sociale dei soldati delle legioni nei primi tre secoli dell'imperio*, Aufstieg II, 1, 1974, pp. 339-91

[7] Le Bohec, Y., *The Imperial Roman Army*, [English translation], Routledge, 1994.

The process of recruitment seems rather analogous to the modern US army. Potential recruits applied to a recruiting board (*probatio*) which examined health and general intelligence, understanding of Latin and in some cases, literacy. Nobles could hope for a centurionship, ordinary citizens a position in the legion, but of non-citizens, merely a position in the *auxilia*, supporting units for the legions. A reference was a major advantage, and there are numerous examples e.g. of Pliny the Younger asking favours for aspiring soldiers from Trajan.

In this way, in the early 1st century CE, the most coveted positions, in the urban cohorts or Praetorian guard, were restricted to Roman citizens from Latium, Etruria and Umbria and the oldest colonies rather than from the inhabitants of the newer Roman settlements in Cisalpine Gaul.[8] Forni also mentions that regions II and III (corresponding roughly to Apulia and Calabria/Basilicata respectively) 'suffered from a demographic crisis' as early as the 1st century CE. This would evidently explain why 'Northerners' from Transpadania and Emilia were overrepresented in the legions outside Italy.

At the same time, as early as the 1st century CE, the legions began to experience difficulties in recruiting within Italy, essentially since fewer and fewer young men wanted to commit to a 25-year tour of duty. Legionaries who had done so would tend to cohabit with local women who occupied the *cannabae*, the shops and entertainment facilities near the military camp and were allowed to marry when they became veterans, so that few returned home.[9]

There were exceptions to this, such as when a new legion was formed with a core of Italians, but in these cases, Forni reports that 'Northerners' were again overrepresented.

If 1st century Italians were unenthusiastic about enlisting, by the late 2nd century CE, their ranks had been decimated by the Antonine Plague (probably smallpox) of 165-180, which may have killed 5 million people throughout the Empire and which, according to the 5th century Spanish writer, Paulus Orosius, exacted a particularly heavy toll on Italy, killing 2,000 people a day in Rome alone and depopulating entire villages.

From these factors alone, it can be seen that in the face of increasing difficulty in recruiting for the legions from Italy, the line of least resistance was to open the legions to the children of veterans, who would tend to congregate around the headquarters of the legions close to frontier zones.

This is clear from the following statistics for the VII Gemina legion presented by Le Bohec[10] and based on Forni's analysis of inscriptions,

Table 1: Numbers of inscriptions citing the origins of centurions

Legio VII Gemina	**1st century CE**	**2nd century CE**	**3rd century CE**
Indigenous Spaniards	2	9	2
Italians	7	7	2
Other Westerners	5	5	5
Easterners	0	0	1

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[8] Claudius (41-54) opened the Praetorian Guard to colonies in Cisalpine Gaul, and as is known, Septimius Severus disbanded the Praetorian Guard for its perfidy in auctioning off the empire after the death of Commodus (in 192), replacing its members with non-Italian soldiers, mainly from Illyria.

[9] Forni notes that (p. 358) during the later 1st century CE, the retirement payment of 3,000 denarii tended to be commuted to a grant of land, albeit in an area far from both the original home of a veteran and from his camp of long-term residence. This practice proved extremely unpopular and was permanently abandoned by Trajan.

[10] Le Bohec, *op. cit.*, pp. 76 and 86

Table 2: Numbers of inscriptions citing the origins of ordinary legionaries

	Italy	Spain				Gauls	Africa	Others	Total
		Lusitania	Baetica	Citerior	Unspecified				
Augustus-68	14	7	19	11	0	10	0	0	61
68-99 CE	5	14	4	22	0	4	0	0	49
2nd CE	1(?)	4	1	20	8	1	4	0	38
3rd CE	0	2	2	12	9	0	4	2	31

While the above figures represent only a small sample of the total number of centurions/legionaries, the latter table in particular shows a clear trend of disappearance of Italians (and non-Spaniards) from the ranks of Spanish legionaries by the end of the 1st century CE. This is evidently entirely consistent with an initial dialectal inheritance which was then adopted as a standard.

We also know that Spain was initially occupied by two legions:

- **X Gemina**, which initially came to Spain under Augustus to fight in the campaign against the Cantabrians (29-13 BCE) and whose veterans settled in Zaragoza (Caesaraugusta, founded in 19 BCE). In 70 CE, the X Gemina was reassigned to present day Nijmegen to police Germania Inferior in the wake of the Batavian revolts.
- **VI Victrix**, also involved in the Cantabrian campaign with veterans settling in Zaragoza, Córdoba and Mérida. This legion founded the city of Léon (Castra Legionis) around 29 BCE and appears to have remained there for the next century policing the Asturias before being reassigned to Germania Inferior by Vespasian in 70 CE.

The place of these two legions was taken by **VII Gemina**, formed in Clunia (near Burgos) by Galba in 68 CE, and stationed at Léon from the establishment of a permanent camp there (originally founded by the VI Victrix in the 1st century BCE) in the same year of 68 CE until the 5th century CE. This legion was also responsible for policing the unruly tribes of the Asturias, the gold mines of Galicia and for civil works such as the bridge over the Tâmega river in Chaves, Portugal.

VII Gemina was also supplemented by cohorts stationed within Galicia at Lugo and Paetaonio, as well as at Juliobriga (Cantabria) and Veletia (Vizcaya). The Gemina (twin) designation appears to refer to its incorporation of the survivors of the Legio I Germanica which suffered devastating losses in suppressing the Batavian revolt of 70 CE.

E.W. Haley[11] cites Gárcia y Bellido's theory that Galba's elevation of Clunia, which had been refounded in the reign of Tiberius, to the status of a colony was accompanied by the settlement of veterans from the Legio VI Victrix, with some dispossession of locals during the 2nd half of the 1st century CE.

If we now look at the distribution of the *pl, cl > š, č* sound shift (to the left and above the unbroken line) illustrated in Figure 1, we can see that it is confined to Galicia, León and N. Portugal.

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[11] EW Haley, *Clunia, Galba and the events of 68-69*, Zeitschrift für Papyrologie und Epigraphik 91 (1992), pp. 159-164.

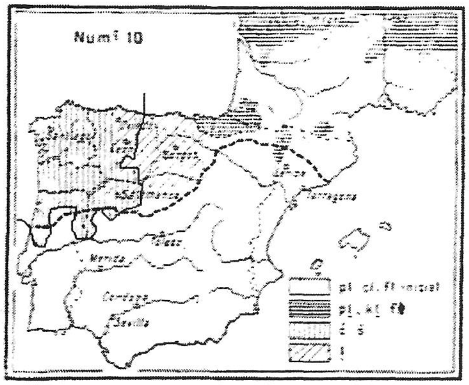

Figure 1: pl, cl > š,č[12]

This is a completely different distribution from that of Menendez Pidal's 'common features' of Leonese and Aragonese shown in Figure 2, such as the palatalisation of the initial l (also present in Catalan) or the preservation of medial *-it-* instead of Castilian *-ch-* e.g. *feito* vs. *hecho*, which is also present in Portuguese, where these two areas (labelled as A and B respectively) represent conservation at the Eastern and Western margins of a much more extensive area (shown with horizontal shading) covering most of North and Central Spain.

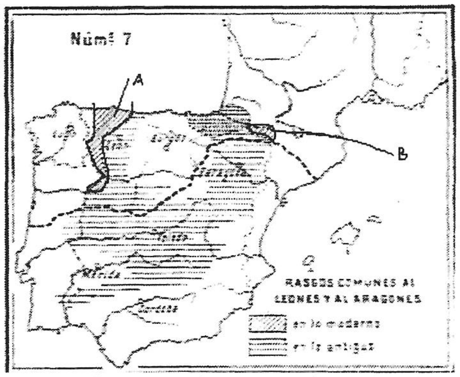

Figure 2. Common features of Aragonese and Leonese[13]

We can see from the above figure that the 180km distance from Clunia to León nevertheless crosses a linguistic boundary, and this, corroborated by the fact that there is no trace of such a sound shift around Zaragoza, Córdoba and Mérida suggests that the members of the VII Gemina arriving in León from Clunia around 70CE (who presumably included former members of VI Victrix), were not responsible for introducing this sound shift. It follows that it must already have been present among the Roman garrisons in the area (which included troops of Northern Italian origin) and hence must be earlier than this date (and later than 30 BCE).

Is it possible that this sound shift is much later? There is nothing in the putative phonology of Suevian and Visigothic (or Arabic) to suggest borrowing from such languages and we know that León was inhabited more or less continuously, except during the first century of the Moorish conquest, when it appears to have been abandoned for settlements in the nearby hills before being resettled definitively in 856.

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[12] R. Menendez-Pidal, *Orígenes del Español*, Madrid, 1926, p. 528
[13] Idem, p. 525

2. AN EARLIER STAGE FOR THE DISSEMINATION OF LATIN AND ITALIC

The evidence for Oscan borrowings into Latin

> We must also consider that during its first century and a half, almost until the war of Sertorius [82-72 BCE], the Roman conquest [of Spain] was not exclusively Roman or even Latin, but the Italics and other elements of the non-unified Italy of the time had a very important role. Until the 2nd century BCE, together with Roman legions, there were Italic legions in the army. The foundation of Itálica [near Seville] after the battle of Ilipa appears to mean that the veterans who established themselves there were more Italic than Roman. That colonies such as Romula (Hispalis) [Seville] or Urso had the surname of urbanorum appears to indicate on the contrary that these were Romans from the capital who characterised the colony. We know that during the first century of the conquest, a large proportion of the legionaries, half or more, were Italic.[14]

The Spanish linguist Menendez Pidal argued that the Aragonese town of Huesca (< Osca) originated from the migration of Oscan farmers from the South of Italy, suggesting that the *nd* > *n* sound shift in the dialect of Northern Aragon reflected an Oscan substrate. He was roundly criticised by Gerhard Rohlfs,[15] who argued that this particular sound shift also occurred in Northern France, Sardinia and Corsica, and that Germanic words (e.g. *stunda* > *estona*), which were evidently later innovations, had also inherited the shift. Indeed, Huesca itself could easily be a corruption of the old Iberian name *Bolskan*.

We must evidently be careful in assigning very ancient origins to lexical items and phonetic changes, but as the above paragraph from Tovar indicates, if, in the initial stages of Roman colonisation of Hispania, over half of the legionaries were non-Latin speakers, it would be extremely unlikely that languages such as Oscan and Umbrian which were spoken over a wider area of Italy than Latin itself had had no influence at all, despite being despised by Romans, and the same must be true to varying degrees of the many other languages spoken in Central and Southern Italy.

Rohlfs himself relents and attributes **glēfa, *glofa, *tēfa, *tufa* [clod of earth] to an Oscan substrate, and derives the South Campanian/Lucanian form *attrufo* [October] from **octufru.*

It nevertheless seems that while Menéndez-Pidal may have chosen his examples poorly, Rohlfs underestimated the influence of Oscan/Umbrian: as the following examples suggest:

1. *venire [*come] – According to Zink,[16] the *w-* sound of *venire* had already been replaced by the bilabial fricative *β* as early as the 1st century CE, and became a labio-dental fricative during the 3rd century, while Spanish has retained *β*. Is this evolution or the adoption of an Oscan form, given that we have Oscan *benus* [Venus], *bivus* [Latin – vivi]. Cf. Logudorese *bennere*.
2. *bovem* [bullock] – we have Umbrian '*bue*' for Latin *bove* – Italian *bue*, Spanish *buey*, Portuguese *boi*, Logudorese *boe*, *bulu*
3. *magis* [more] – Oscan form *mais*. As is well known, Iberian and Romanian use *magis*: Romanian *mai frumos*, Portuguese *mais alto*, Spanish *más largo*, Catalan *més ric*, as opposed to French *plus grand*, Italian *più grande. Plus* and *magis* are not territorially exclusive, as can be seen from Old Portuguese *chus pequeno*, or Gascon *més malaut*, but the interesting point about these examples is that there is no trace of medial *g* and its presence in Romanian argues for a date earlier than the 3rd century.

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[14] A. Tovar and J.M. Blazquez, *Historia de la Hispania Romana*, p. 159, my translation.
[15] G. Rohlfs, Oskische Latinität, in *Romanische Sprachgeographie*, Munich, 1971, pp. 38-41
[16] Zink, *op. cit.*, p.144

4. *lingua* [tongue] – We have Logudorese *limba* and Romanian *limba* – cf. Umbrian *umen* for Latin *unguen*, Oscan *kumbennieis* for Latin *conventum*.
5. *aqua* [water] – we have *ábba* in Logudorese and *eba* in Sassarese and *apă* in Romanian, versus *aapam* (Acc.) in Oscan.
6. *equa* [mare] – we have *ebba* in Logudorese, Sassarese and Gallurese and *eba* in Algherese, against *iapă* in Romanian. There is no extant form in Oscan, but the close similarity with 4. and 5. is highly suggestive.
7. *quattuor/quinque* [four] – *battoru* but *chimbe/quimbe* in Logudorese (although 15 is *bindighi*), *patru* but *cinci* in Romanian, vs. *petur/pempe* in Oscan. 'five' is evidently not a perfect fit, but the older Logudorese form still shows the influence of Oscan *-mp-/-mb-* = Latin *-nk*^{w}-

It is not possible to explain the spread of these 'Oscan' forms into Sardinia with the same degree of detail as *pl, cl* > *š, č* in Spain, since we are dealing with an earlier period of Roman history. We can nevertheless see that such features of Sardinian are specific to the Logudoro, which represents the most fertile area of the island with its main city in the 2nd century BCE, Cornus, having led an ill-fated attempt to chase out the Romans in collusion with the Carthaginians. In 177 BCE, the tribes in the Northern part of the centre of the island, the Ilienses and the Balares, revolted and the result was wholesale ethnic cleansing by the Romans, which resulted in the enslavement of so many natives that the price of slaves in Rome collapsed (*sardi venales*). From then on, legions guarded the fertile plains of the Loguduro against incursions from the centre of the island.

While the link between the South of Italy and Sardinia is not entirely clear, the fact that there is such a link is attested by the conservation in both areas of the archaic vowel system [*ī, ĭ* > *i*] [*ĕ, ē* > *e*] [*ā, ă* > *a*] [*ŏ, ō* > *o*] [*ŭ, ū* > *u*] as described by Lausberg.[17] This system was also implanted in the Latin of North Africa, which must have been introduced from the time of the Punic wars onwards and was presumably well established by the end of the 2nd century BCE, since we know that during Jugurtha's revolt (112-106 BCE), he massacred many Roman settlers in the town of Cirta (modern Constantine in Algeria) and in the aftermath of his defeat, land in his Numidian (Coastal Algeria bordering Tunisia) kingdom was distributed among the legionaries. This vowel system is also preserved in the mountainous region of Northern Calabria around Monte Papa and Monte Pollino, and we also know that the Lucanians, who were Oscan speakers, had entered into alliances with Rome against the Greek colonists of Taranto in 298 BCE and that Rome had progressively established colonies in this area: Venusia (291 BCE), Paestum (273 BCE) and Tarentum (272 BCE).

We thus appear to have a similar phenomenon of the spread of dialectal forms of a client people integrated into the Roman army, with these forms then fixed in a relatively underpopulated area, usually following the successful quelling of a revolt by the natives. Anyone familiar with the colonial history of the 19th and 20th centuries will no doubt have a sense of déjà vu.

According to Lausberg, links between the South of Italy and Romania postdate the formation of the 'Italic' vowel system [*ī* > *i*] [*ĭ, ē* > *ẹ*] [*ĕ* > *ę*] [*ā, ă* > *a*] [*ŏ, ō* > *o*] [*ŭ, ū* > *u*]. This new system has been conserved in Eastern Lucania (around Castelmezzano to the west of Matera), although Lausberg posited that it extended to the Adriatic and would hence have been taken into the Balkans by legionaries originating from these areas.

Indeed, the changes between Latin and Romanian dated by Marius Sala[18] to the 2nd and 3rd centuries CE are not even specific to Romanian but are generalised, with many appearing in the *Appendix Probi*, a list of the correct and incorrect pronunciations of 227 words usually dated to the 3rd to early 4th centuries:

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[17] Described by H. Lausberg, *Linguistica Românica*, Lisbon, pp. 112-113 [a Portuguese translation of *Romanische Sprachwissenschaft*], Berlin 1956-63. Lausberg was an expert on the dialects of Lucania.

[18] Marius Sala, *From Latin to Romanian*, Mississippi, 2005, pp. 33-34

- *magister* > *maester*: extensive in S. Italy;[19] cf. Zink dates in Gallo-Roman *legem* > *lẹ́yye* to 3rd CE (p. 104).
- *alveus* > *albeus*: Appendix Probi *alveus non albeus*
- *diebus* > *zebus*: Oscan influence?: Oscan *zicolos* = Latin *diebus*
- *tertium* > *tersiu*, Generalised, documented in 2nd century CE,[20] e.g. *Crescentsianus, tercius*, preserved in Spanish *ratio>razón*
- *vetulus* > *veclus*: Appendix Probi *vetulus non veclus*
- *septembris* > *setembre*: Appendix Probi *auctoritas non autoritas*
- *frater* > *frate*: General in Tuscan/Ligurian/Milanese,[21]
- *passere* > *passar*: Appendix Probi *passer non passar*
- *silvaticus* > *salvaticus*: in the Mulomedicina chironis (4th Century CE)
- *rotundus* > *retundus*: generalised in Italian dialects, Old Tuscan *retondo* (< *rotondo*), Calabrese *ritunnu*, Old Paduan *reondo*[22]

In the same way, we may note that Romanian *eu sunt/ele sunt* (I am) is easily explained by an origin in Italian dialects:

> In the first person, Northern Italy shows, beside the widespread **son**, also the **sonto** of Milanese, Padovan and Veronese dialect. This form goes back to the time when the 3rd person plural used both **sont** and **son** ... The confusion between **sum** and **sunt** observed in Northern Italy reappears in the South. Salento has **suntu** or **sòntu** (I am), Taranto and Matera **sòndə.**[23]

Even the bizarre phonological changes in the language of the Vlachs, Aromanian, which is spoken in isolated enclaves from Albania across the Pindos mountains and in Macedonia and Greek Thrace, have their counterparts in the Italian dialects

- *b* > *gh* (It. *bene*, Ar. *ghine*), Calabrian *gurza* (borsa), *gutti* (botte)[24]
- *f* > *h* (It. *fegato*, Ar. *hicat*), *f>h*, Reggio di Calabria (*hierru*), Bresciano, Comasco, Belluno[25]
- *v* > *y* (*verme*, *iermu* - worm), Tuscany, Umbria, Marche *v* > *g*, Cervara (Marche) *èreme* (worm)[26]
- *m* > *nj* (It. *miele*, Ar. *njare*), *m>n*, generalised, even in French *natte*, *nèfle*[27]
- *pi* > *ci* (Ar. *cicior* – leg from *pes, pedis*), and *p* > *ch* (It. *petto*, Ar. *cheptu*) can presumably be explained by analogy with *b* > *g*.

What is notable is how extensive these dialectal forms are within Italy. Indeed, the above suggests that Istro-Romanian spoken in Dalmatia/Istria and Aromanian may not result from migrations from Romania during the early Middle Ages but merely reflect the surviving speakers at the fringes of a large 'Balkan Latin' speaking area which in turn inherited these Italian dialectal forms.

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[19] Rohlfs, *Grammatica storica della lingua italiana e dei suoi dialetti.*, *Fonetica p. 301*
[20] Rohlfs, *op. cit.*, *Fonetica p. 409*
[21] Rohlfs, *op. cit.*, *Fonetica pp. 429-30*
[22] Rohlfs, *op. cit.*, *Fonetica p. 462*
[23] Rohlfs, *op. cit.*, pp. 269 and 271
[24] Rohlfs, *op. cit.*, *Fonetica* p.196
[25] Rohlfs, *op. cit.*, *Fonetica* p. 206
[26] Rohlfs, *op. cit.*, *Fonetica* p. 229
[27] Rohlfs, *op. cit.*, p. 219

Another interesting point regarding the above shifts is that Spanish/Gascon *f>h*, traditionally attributed to a Basque influence, may merely be a similar manifestation of one of the above Italian dialectal variants, particularly since the original area of this sound extended almost as far West as León, and would have included Clunia to the South of Burgos, i.e. away from traditional areas of Basque settlement.

In my view, the above changes reflect a double process. The implantation of dialectal forms, which become fixed in remote areas but which are 'corrected' in the more 'civilised' populated areas of the empire. In this way, I suspect that changes such as *pl, cl > š,č or > pi, ci* also occurred in Gaul, but there was a countervailing influence which suppressed them in favour of a correct *'pl/cl'*.

This process appears to be entirely analogous to British English, where the middle classes speak a standard BBC English (albeit latterly with the spread of a London accent, 'Estuary English'), while the lower classes speak dialect or have a strong regional pronunciation. It is only when dialect becomes the focus of national identity (e.g. in Scotland) that it transcends class barriers, which appears not to have been the case under the Roman empire. To the ears of the educated, literate Romans, everything would have been 'proper Latin' or 'bad lower class Latin', like the emperor Septimius Severus, who spoke with a thick African accent and whose sister embarrassed him so much with her awful Latin that he sent her home.

But non-standard forms can endure for centuries, as is illustrated by Modern Brazilian Portuguese: Correct usage states that a) the plural of *a menina é bonita* (the girl is pretty) is *as meninas são bonitas* (the girls are pretty), while b) the present tense of *ir* (to go) has six forms: *vou, vás, vai, vamos, vaís, vão*, only within Brazil, the *tu vás* and *vós vais* are already archaic (the *tú* form is used in Rio Grande do Sul), having been replaced by *você vai* and *vocês vão* (cf. Italian *Lei, Loro*). The average construction worker from the Northeast who speaks 'bad Portuguese' will use *eu vou*, but *você vai, nós vai, vocês/eles vai* – i.e. only 2 forms of the present tense or will say *as menina é bonita*.

This simplification has traditionally been attributed to the effect of African/indigenous speakers on Portuguese. A recent study by Naro and Scherre[28] nevertheless showed that all of these forms are present in communities of fishermen in rural Portugal and hence must date back to the 16th/17th centuries, if not earlier, thereby demonstrating that such 'creolisation' is a myth. While there are evident differences between Brazilian and European Portuguese, this kind of analysis suggests that there never was a Portuguese pidgin spoken in Brazil (if anything, the lingua franca spoken in the interior of Brazil was not even Portuguese, but Tupi).

Naro and Scherre also cited evidence from Tok Pisin of New Guinea [Sankoff] that the distinction between a pidgin (i.e. a lingua franca used by native speakers of other languages) and a creole (an invented lingua franca which is a native language) is a false one in that Tok Pisin had been spoken as a pidgin since the 19th century, becoming the native language (creole) of a new generation of New Guineans in the 1960s and 1970s, but that there was no recognisable change between the language spoken by non-native speaker parents and native speaker children.[29]

In similar vein, standard French suggests that *ça!* or *on va* is colloquial French as opposed to higher register *cela* or *nous allons*, but *ça* (as a contraction of *cela* as opposed to *çà*) dates back to at least 1642 and the use of *on* may well go back to Roman times. Indeed *om* is present in the earliest French document (Strasbourg oaths of 842) and the *Robert Historique* notes that:

> Since all of the other Romance languages, including Italian and Spanish, are also familiar with representatives of homo as an indefinite pronoun, it is unlikely that this phenomenon, also

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[28] Anthony Julius Naro and Maria Marta Pereira Scherre, *Origens do português brasileiro*, São Paulo, 2007.

[29] *Ibid*, p. 51

> observed in German (man)....was influenced by Frankish. However, it may be thanks to the Franks that the usage of 'on' became more general and more frequent in French than that of the corresponding forms in the other Romance languages. For example, Occitan speakers draw a distinction unknown in French: they say on when the speaker is included in the number of persons of which they are thinking; otherwise they use the third person plural.[30]

Catalan irregular verb forms as a key to understanding the prior diffusion of Latin

If the origin of standard forms in the modern Romance languages such as Spanish and Portuguese lies in the precursors of Italian dialects (which, as demonstrated above, correlate with movements of legionaries), we still have to explain how these dialectal forms originated in a relatively short period of time, given that these areas were the last areas of the Italian peninsula to be Latinised, since the Po Valley and Campania/Calabria/Sicily had only been Latin speaking (and then only partially) for 50-100 years when Sardinia and Catalonia were acquired, and for only 2-3 centuries when Rome expanded into Gaul and the remainder of Iberia. Does this undermine the conservative case?

If we again consider the spread of English into the United States, Virginia and the 'Deep South' received a West Country dialectal inheritance and New England an East Anglian inheritance, but the locus of differentiation of these two dialects in time and space is not the United States of the 17th century, or even England of the Middle Ages, but could be Germany/Denmark/Frisia, hundreds if not thousands of years earlier, as these areas of England were settled by tribes of different origins.

In the same way, while we evidently have some examples of influence from non-Latin languages spoken throughout the peninsula (we have shown this for Oscan and there are probably parallel Celtic influences specific to Northern Italy which explain the *pl, cl > š,č* sound shift there), the major locus of differentiation of the Northern Italian dialects from the Southern ones was not North Italy and South Italy but around Rome itself. In other words, the various dialects of Italian which are now spoken in Sicily, Calabria, Campania, Tuscany, Rome, Emilia, Liguria, Lombardy, the Veneto, etc. derive from a series of class/regional dialects of Latin which were spoken in the core area of the Roman Republic but which had hence been differentiating from each other for centuries, if not millennia before the Roman Republic expanded outside its core area in Central Italy and which were already old when they arrived in the new settlement areas of the Po Valley, Sicily, Sardinia, etc. We are thus observing what geneticists would term 'founder effects'.

The validity of this paradigm can be seen by considering the irregular first person present tense forms of Catalan: *soc* [I am (ser)], *estic* [I am (estar)], *vinc* [I come], *tinc* [I hold], *escric* [I write], *crec* [I believe], *vaig* [I go], *faig* [I do], *puc* [I can], *conec* [I know], *dec* [I must], *venc* [I sell], *ric* [I laugh], *veig* [I see] (NB: *-ig* is pronounced *-č*, hence *faig* [fač], *veig* [več]). Where do these strange forms with a final *–c* come from, since they evidently are not 'exceptionless sound shifts'?

It is highly significant that these forms appear in Catalan,[31] for Catalonia was one of the earliest Roman colonies, acquired in the wake of Hannibal's defeat, 100-200 years before the Romanisation of Gaul and other parts of Iberia and even the North of Italy.

The following passages from Rohlfs' *Grammatica storica* support an Italian dialectal origin for these forms:

Take the verb 'to have' in Catalan: *Haver – he/haig* [I have], *hem* [we have].

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[30] *Le Robert Dictionnaire historique de la langue française*, Paris 1998, p. 2458

[31] Grandgent suggests some similar forms for Old Provençal, e.g. *tenh/tenc*, *vei/vec* without explaining which is the dominant form.

> In the South of Italy, we find for the first person aju (Sicily, Calabria), in part aggiu (Puglia, Campania, Lucania). Less widespread is the form agghiu. Corsica presents aghiu. Besides aju, Sicilian knows the atonal form e, written hê in traditional orthography), used as an auxiliary verb, also in the sense of 'have to'.[32]
>
> In the first person plural, the forms are avimu (Salentino aímu) and avémə. The form avèmu (also aviemu), notably widespread in Sicily, shows, with its open vowel, shows Ligurian influences. Atonal and reduced forms are amu (Sicily, Calabria), amə (Lucania, Campania), **émo** (Southern Lazio), émə (Abruzzo).[33]
>
> In Versilia, Pisa and Muggello, veggo [Italian vedo, Catalan veig] is still alive...The dialects of Lucca and Pisa have vaggo, of Cortona chiuggo (standard Italian chiudo). Sienese knows chiuggo and deggo [Italian devo, Catalan dec]. Numbered here are probably also the forms of Versilia (dago, stago), of the Lunigiana (vago, dago, stago, fago) and the extremely widespread forms dago, stago, vago of Northern Italy: Old Paduan dago, stago, vago, fago, dego, rigo [I laugh – Catalan ric], Veneto dago, stago, vago, Romagnolo dag, stag, vag, deg [I say – Catalan dic], Ligurian dagu, stagu, vagu, Old Ligurian vego, Corsican dogu, stogu, vagu, vegu. Also in Southern Italian we find g notably generalised, cf. South Latium: Velletri dòngo [I give], Sezze tòngo ... Campania (Naples) vènghə [I sell – Catalan venc]....(Procida) vagghə [I go], vogghə [I want], Pugliese (Bari) dògghə [I give], vògghə [I go], stògghə (I stand, am), digghə [I say], menghə [I lead].[34]
>
> Verbs in –co. On the basis of the parallelism between conosce (nasce, cresce) and esce, from exeo, we have esco instead of *escio, analogously to conosco, nasco, cresco; and hence escono instead of *esciono (cf. also Old Spanish exco). This –co has its greatest extension in Naples, cf. mecco (Italian metto, I put), aspecco (aspetto), promecco (prometto), jecco (getto)...there is thus a substitution of –to by –co, without the starting point of the analogy being identifiable. Naples véchə, at Pozzuoli vaichə (< vechə) [I see] and **old Roman faco, staco, haco, soco.** In Eastern Lucania and the Tarantino, we have stòche [sto] and dòchə [do]. Around Bari –co is very widespread.[35]

The key insight here comes from the fact that these changes are present in the Romanesco dialect around Rome (*faco, staco, haco, soco*) as well as in both Northern and Southern Italy. The Catalan forms can evidently be derived from these Italian dialectal forms with minimum effort (as opposed to major contortions to derive them from classical Latin), but it is the extensiveness of these forms and their presence within Latium which suggests that their ultimate origin is in Rome itself and its surrounding territories.

But if we look at Catalan dialects, we find multiple forms:

- I am – *sóc, sọ, sọm, sik*
- I have – *he*, but also *ẹ, ái, áik, a, aš*
- I go – *vaig* but also, *bái, báik, bát, bášk,*

although the other persons of the present tense show little divergence from the standard Catalan paradigm (*ets/eres, es, som/sem, sou/seu, són*), (*has, ha, hem/avem, heu, han*), (*vas, va, anem/vam, aneu/vau, van*).[36]

If we consider 'I go', we can derive most of these forms with little effort from the wide variety of such forms present in the Italian dialects: Old Ligurian/Old Padovan/Old Venetian *vago*, Romagnolo *vag*, Sicilian and Calabrese *vaju*, Abruzzese *vajə*, etc. What, conversely, seems extremely hard to explain is how these forms could have developed *in situ* from a homogeneous 'Vulgar Latin', since these are not wholesale phonological changes, but changes in a single person of the verb. Why would so much diversity suddenly develop for no good reason?

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[32] Rohlfs, *op. cit.*, *Morfologia*, p. 274-5
[33] Rohlfs, *op. cit.*, *Morfologia*, p. 275
[34] Rohlfs, *op. cit.*, *Morfologia*, p. 260
[35] Rohlfs, *op. cit.*, *Morfologia*, p. 260
[36] Margarit, A.B., *Gramática Histórica Catalana*, Barcelona, 1951, p. 331

3. THE "1:5" RULE OF THUMB FOR EXPLAINING LANGUAGE REPLACEMENT

In the MTXIII article, I drew on the palaeodemographic work of Bardet/Dupâquier[37] and McEvedy,[38] to show that the putative rapid spread of Indo-European by nomads from the Pontic Steppes was entirely at variance with the relative failure of nomads in historical times to impose a new language on sedentary population. The Hunnish/Gothic/Burgundian invasion of Gaul in 451 being a case in point, in that 300,000 of their number utterly failed to turn 6 million Gauls into a nation of Germanic speakers. Nor have other warrior élites been any more successful, even after centuries of hegemony, as is witnessed by the fact that French is not the mother tongue of Englishmen despite 350 years (and some would say 1,000 years) of Norman hegemony, Spaniards don't speak Arabic and the linguistic conquests of the Völkerwanderung of Germanic tribes hardly go more than 100 miles beyond the Roman limes with the possible exception of Switzerland.

Indeed, I find absolutely nothing in the demographic and historical evidence of the last 2-3 millennia to support the official Indo-European ideology that the quasi-ubiquity of Indo-European was due to a few thousand nomads.

Instead, there appears to be a rule that wholesale language replacement only occurs when there is a critical ratio of immigrants to natives. It is evidently impossible to specify this ratio precisely since we are dealing with estimates and probably many contingent factors, but it is likely to be somewhere between 1:3 and 1:6 (I have called it the "1:5" rule). Whatever the figure may be, it certainly isn't 1:20 or 1:30.

In order to be valid, this model must nevertheless explain the apparent counter-examples of Germanic invaders successfully shifting the language of Britain from British/Latin to Anglo-Saxon, of Turkish invaders imposing Turkish on Turkey and Hungarian invaders imposing Hungarian on the plains of Pannonia.

1. Hungary

I shall merely quote McEvedy here, since he is the only source who quantifies his conclusions:

McEvedy assumes that Hungary had some 300,000 inhabitants at the height of the Roman Empire (2nd century CE, and then:

> The frontier held until the 3rd century CE. Then barbarian invasions brought successive waves of depopulation and repopulation as the original inhabitants were replaced by wandering tribes of Germans, Huns or Slavs. The demographic nadir was probably reached during the Avar supremacy of the 7th century. The Avars, like the Huns, were full-blown nomads from Central Asia, and as such, liked to keep their grazing land free of peasants. In their day, Hungary probably contained no more than 200,000 people, half of them Avars and their dependants, half of them frightened peasants of debatable ancestry.[39]

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[37] Bardet, J.-P. and Dupâquier, J., *Histoire des populations de l'Europe*, Paris 1997.
[38] C. McEvedy, *Atlas of World Population History*, London 1978.
[39] *Idem*, p. 92

McEvedy then assumes that some 100-200,000 Hungarians then occupied the area at the end of the 9th century. It may well be that some of the Avars spoke Hungarian, but in any case, the ratio of immigrants to natives would have been no more than 1:3.

2. Turkey

A simple population ratio evidently only has explanatory power for a population shift which occurred within a well-defined time interval, which evidently is not true of the complex processes of Byzantine/Seljuk/Ottoman history which led to the predominance of Turkish in Turkey, and which were only fully completed in the 20th century with the formation of the Turkish republic. In any case, I have not been able to find any reliable estimates of the relative population sizes until the tax surveys of the end of the 15th century.[40] By 1489, the Muslim takeover of Anatolia was complete with some 832,000 Muslim households, against 4,600 non-Muslim households in Anatolia (Greeks and Armenians) and another 27,000 (mainly Greeks) in the Trabzon-Rize area on the Black Sea coast, conquered in 1461.

We can nevertheless perceive a series of hostile factors stretching over 500 years which would have militated against the maintenance of large Greek-speaking populations in Asia Minor, starting with the aftermath of the defeat of the Byzantines at the battle of Manzikert in 1071, which led to the permanent loss of the Anatolian plateau to the Seljuk Turks and its peopling by Turkic nomads. This evidently led to the flight or conversion of the Greek speaking peasantry to Western Anatolia. While forced conversions must have taken place, as in Avar Hungary, the hegemony of pastoralist nomads would initially have created a class of landless peasants and a decline in population density. At the same time, the Seljuks continued to expand their domains, taking South West Turkey as far as the Mediterranean by the end of the 12th Century, in a process which was subsequently accompanied by the religious 'nucleation' of Western Turkey by dervishes as well as by the spontaneous penetration of the river valleys of Western Anatolia by semi-sedentary nomads starting as early as the 11th century CE. Within the heartland and east of Anatolia a tension also arose between those nomads who adopted agriculture (and were favoured by the central state as they contributed more tax revenue) and a continual inflow of Turkmen nomads from central Asia.

From the 14th century CE onwards, the rising Ottoman empire systematically promoted the resettlement of Western Turkey and the Balkans by landless peasants from Anatolia, who were offered land in Thrace and also systematically deported and converted the original inhabitants to Islam, who in some cases were not opposed to them since the Ottomans were less oppressive than their Byzantine predecessors. This was combined with continuing military upheaval and periods of violent chaos (Civil wars of 1321-25 and 1341-6 in Thrace, the repeated waves of Plague, the invasion of Timur in 1402 and the Celali revolts of the 16th century).

At the same time, there were still residual speakers of Cappadocian dialects of Greek who had been isolated from the rest of the Byzantine empire after 1071 (as well as other Greek speakers the Aegean coast and in Trebizond) as late as 1920. Indeed, the presence of a small community of Cappadocian Greek speakers until the 20th century is in itself an indicator of the fact that the relative numbers of incoming Turks after 1071 was substantial, since Greeks were given the option of maintaining their own language or switching to Turkish. If Turkish had only been the language of a small élite, the region would probably have remained bilingual.

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[40] Barkan, cited in Inalcik, *An Economic and Social History of the Ottoman Empire: 1300-1600*, Cambridge 1994, p. 27.

3. England and Wales

The nature and causes of the shift within Roman Britain from a predominantly Latin and Celtic speaking to an Anglo-Saxon speaking one are still debated.

The traditional view, derived from Gildas, Procopius (who mentions Angles and Frisians), Nennius and most consistently, Bede, has been ethnic cleansing of Britons, who fled to the Celtic fringe and their wholesale replacement by incoming Germanic tribes. Indeed, Bede noted that Jutes had occupied Kent and Hampshire, the Angles had occupied East Anglia, Mercia and Northumbria, with the East, West and South Saxons (Essex, Wessex and Sussex). Bede and Gildas posited the origin of this invasion in a mid-5th century revolt by Germanic mercenaries who then invited their kin to settle.

The traditional view was challenged by archaeologists in the 1980s, who argued for continuity and the absence of evidence of invasion and conflict.[41]

This was in turn challenged in the late 1990s by Heinrich Härke and others, who argued for rapid population decline, mass migration of Germanic peoples and the imposition of an apartheid-like culture in which a considerable British population remained in England but in a position of subordination/enslavement. His co-author Mark Thomas has written a number of papers arguing for genetic continuity between Frisia and Central England as opposed to a genetic boundary between Central England and Wales.[42,43] Pattison[44] questioned this assumption of social apartheid, arguing that there was evidence for mixing of Germanic immigrants and Britons.

There have also been a number of suggestions of a previous Germanic presence in at least the flat Eastern part of England, dating from the Neolithic or the immigration of Germanic speaking Belgae around 100-80 BCE (cited in Caesar) or a gradual build-up of Germanic mercenaries (*foederati*). Indeed, Pattison argues that there could have been 10,000 Germanic mercenaries serving in the Roman armies in Britain, and that 25% of the population of the South East (20% of the whole) could have been Germanic-speaking Belgae.

Härke[45] uses estimates by M.E. Jones, Millett and Arnold to assume a peak population of Roman Britain of well over 2 million (up to 4 million), which then declined in the 5th century to a low of 1-2 million, thus implying a catastrophic 5th century die-off. Pattison also estimates a pre-Roman population size for Britain in 1 CE of 2.6 million.

Frankly, I find the idea of 2-4 million people in Britain prior to the Roman invasion followed by a catastrophic decline, an untenable one for a number of reasons:

a) This implies a population density of 20 people per km^2, higher than the richest and most densely populated area of the Empire, Italy, for which there are plausible estimates of a population in 14 CE of 7 million,[46] declining to 5 million by 400 CE. Indeed Maddison[47] points out that Italy had a per capita GDP of $809 (in 1990 dollars) against $470 in France and $400 in England, for the obvious reason that it was the centre which extracted enormous wealth from the periphery and could thus support higher population densities.

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[41] Cf. Francis Pryor, Britain AD, Harper, 2004, Ch. 6 for a (not very convincing) defence of the gradualist position.

[42] M.A. Weale, D.A. Weiss, R.F. Jager, N. Bradman, M.G. Thomas, *Y Chromosome Evidence for Anglo-Saxon mass migration*, Mol. Biol. Evol., 19, 1008-21 and

[43] Thomas, M.G., Stumpf, M.P.H. & Härke, H., Evidence for apartheid-like social structure in Early Anglo-Saxon England, *Proc. R. Soc., B 283, 2651-57.*

[44] J.E. Pattison, Is it necessary to assume an apartheid-like social structure in Early Anglo-Saxon England? *Proc. R. Soc., B 2008,275, 2423-2429.*

[45] H. Härke, *Anglo-Saxon immigration and ethnogenesis* [forthcoming].

[46] Bardet, J.-P. and Dupâquier, J., *Histoire des populations de l'Europe*, Vol. 1/p. 121.

[47] Maddison A., *Contours of the World Economy*, Oxford, 2007, pp. 52 and 56

b) Roman Britain never had a huge city with 300-700,000 inhabitants like Rome and Pryor points out that the archaeological evidence suggests that cities collapsed at a much earlier stage, at the start of the 4th century CE. If cities were relatively marginal in terms of the economy of Roman Britain, then their collapse would have had only a marginal effect on the overall economy and society of the province.

c) Britain was never comprehensively ruined by Germanic invasions in the mid-late 3rd century like Northern Gaul, as is witnessed by the enormous difference between the 4th century villas in Roman England with their lavish mosaics and those of 3rd century Northern Gaul, which were permanently abandoned in an area turned over to the Salian Franks.

d) There were few major epidemics between the Antonine Plague of 165-180 and the appearance of plague in the 440s. In this way, in 400 CE, Britain's population would still have been close to its peak, since it was less adversely affected by civil wars, epidemics and barbarian incursions than Gaul and Italy.

e) If the population density of Roman Britain was double that of in Roman Gaul at its Imperial peak, then we have to explain why its pre-Black Death population density was actually lower than in France. Evidently, if it started from a much lower base, this becomes a non-issue.

f) The populations of Ireland and Scotland were relatively small (cf. Figure 3 below) but the Picts seem to have caused major problems for the Britons remaining in England after the withdrawal of the Roman legions. Why would this have been such a problem if England had over 2 million people?

As such, Colin McEvedy's figure for 400 CE of 800,000 people in England and Wales, which is substantially in line with Beloch and Frier[48] as well as with Bardet & Dupâquier, seems much closer to reality:[49]

Table 3: McEvedy's population estimates for 400CE

Country	Population in 400 CE ('000)	Area (km^2)	Population density (inhabs/km^2)
ROMANISED AREAS			
Spain	4,500	504.0	8.9
Italy	5,000	301.3	16.6
Belgium	300	30.6	9.8
France	5,000	543.9	9.2
England & Wales	**800**	**130.4**	**6.1**
BARBARIAN AREAS			
Netherlands	200	37.3	5.4
Germany	3,500	357.1	9.8
Sweden	250	441.4	0.6
Norway	125	323.8	0.4
Denmark	300	43.1	7.0
Ireland	200	83.9	2.4
Scotland	100	78.1	1.3

Source: C. McEvedy, *Atlas of World Population History*, London 1978.

It is immediately clear from the above table that in population density terms, at 16.6 inhabitants per km^2 Italy was double the Western European average, while a figure of 6.1 inhabitants per km^2 for England & Wales is entirely consistent with other parts of the Western Roman Empire.

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[48] Maddison A., *op. cit.*, p. 35

[49] These are very rough figures, so that a) I have assumed that it is unnecessary to adjust for land areas at the time (this is probably only an issue for Holland due to rising sea levels), b) the actual densities for Norway and Sweden are probably 2-3 higher as we have to exclude large areas of the North of these countries which would have been empty.

Clearly, the application of our 1:5 rule makes it clear why 100-200,000 Anglo-Saxons could have caused language change in England and Wales, which only had 800,000 inhabitants, when 300,000 Goths/Huns/Franks failed to do so in Roman Gaul (which was larger than modern France) with a population of 5.75 million in 400 CE.

But can we analyse this process in greater detail? Using these population densities, we can calculate the populations in the putative homelands of the Anglo-Saxons using a figure of around 5-7 inhabitants/km^2. Hence, if we take an area for Frisia (c. 20,000km^2), its total population around this period would have been 100-140,000. Schleswig, which is the putative homeland of the Angles is only around 5,000 km^2 in area, and thus would have had a population of 25-35,000, while Jutland (30,000 km^2) would have had a population of 150-210,000 around 400 CE.

If we then take modern Lower Saxony minus East Frisia as a proxy for the Saxon territories (c. 45,000 km^2, then this area would have a putative population of 225-315,000. The predominance of the Saxon contingent may explain why the Celts refer to the English as Saxons (Sys/Sassenachs).

Of note in the above figures is the fact that only 30,000 Angles achieve a prominent position in the invasions.

We might also expect an overrepresentation of Frisians since they alone were threatened by rising sea levels, and there is the precedent of the Ambrones: a Frisian people, 30,000 of whom joined the raids of the Cimbri (with a traditional origin in Northern Jutland) and the Teutones in 112-106 BCE. Having said this, a catastrophic rise in sea levels had driven Frisians off the North Sea Coast between 250-400 BCE, with some even migrating to Britain, and by the fifth century, the Frisians were actually returning to their ancestral coastal homelands.

Härke's claims that over two centuries, 250-500,000 Anglo-Saxon males migrated to Britain thus looks like a very high figure, particularly if combined with other depopulating factors such as plague, famine or merely seeking territory elsewhere in Continental Europe.

Whatever the ultimate number of immigrants, the initial incomers would have had to establish a bridgehead which was then extended by further migration.

The traditional account in Bede, greatly embellished by Geoffrey of Monmouth in the *Historia Brittonum,* has a native king, Vortigern, first inviting in Germanic mercenaries to deal with Pictish incursions in 429 CE. Civil war and famine during the period 440-450 causes Vortigern to request help from Aetius against the Picts and Scots, but Aetius cannot oblige as he is fighting Attila. Vortigern then turns to Anglian mercenaries to defend the North of England and they receive a grant of land in Lincolnshire.

Matters worsened greatly with the appearance of plague in 448, which, as is known, could kill 10-30% of a population.

In 458-460 CE, there was a mass migration of nobles from Dumnonia (Cornwall) to Armorica (Brittany).

In 459 CE, the traditional account has Hengest luring 300 British nobles to a peace conference and then treacherously murdering them all.

In 477 CE, the Saxon warrior Aelle invaded Sussex and gradually became the most powerful Anglo-Saxon king established dominance over the other Anglo-Saxon kingdoms.

John Morris[50] claims that the Angles actually lost Lincoln to King Arthur but that the remainder of the Angle nation migrated from Schleswig in the latter stages of Arthur's campaign, culminating in the British victory at Mount Badon in 495 CE. This would explain why the Angles were fully occupied thereafter holding their own territories and how, at a later stage, they were dominated by the Wuffing dynasty based in Suffolk, which ruled East Anglia between 560 and

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[50] J. Morris, *Londinium*, London 1982, p. 338.

760 CE, with a traditional origin in Östergötland in Central Sweden. The Angles no longer had a hinterland from which to draw reinforcements.

Morris further claims that the British victory of Mount Badon represents the defeat of a combined effort by Saxons Aelle from Sussex and Cerdic from Hampshire, the Angles and the Jutes from Kent under Hengest's successor, Oesc, to break through the Thames Valley and resulted in a truce which held the British-Saxon frontier at a line running from Hampshire to Yorkshire for 50 years before the Anglo-Saxon advance resumed.

Peter Kessler provides a series of maps[51] illustrating the process of transformation of the political landscape following the departure of the Romans in 410 CE, with the first stage being the emergence of independent British kingdoms in Wales, Bernicia (Northumberland), Dumnonia (in Devon and Cornwall, an area which even in Roman times had been something of a law unto itself), and Kent, possibly as early as 420 CE.

Kent is notable as one of the few areas to maintain the pre-invasion name of the Cantii. Indeed, the Cantii were a Belgic (possibly Germanic speaking) people and may have had a Frisian contingent who had settled after they were forced out of their own lands by rising sea levels from 250 CE onwards. According to Kessler, Ceint re-emerged as a small regional kingdom after the withdrawal of Roman authority in 410 CE. Assuming a population density of 6 inhabitants/km^2 for an area of 3,500 km^2 implies a native population of 21,000, so that it could probably have been overrun by as few as 5,000 armed Jutish immigrants under Hengest and Horsa, who had seized the Eastern half by 473 CE and the whole county by 488 CE.

The fact that this occurred suggests that the notion of the Belgae as a 'Germanic fifth column' recognised as 'brothers in arms' by the incomers on account of their Germanic 'ethnicity' is a piece of historical revisionism or 'Aryanist' wishful thinking. Perhaps at a later stage, the locals were recruited into a fighting force which took over the rest of the island, but the fact remains that the Belgae had territories stretching across the whole of Southern England and it seems very unlikely that the Germanic incomers would have delicately stepped around them and only attacked Britons.

In the case of East Anglia, the process appears to have been much slower, with isolated coastal settlements of Germanic tribes dating back to the 4th century, suggesting that they were invited to settle as defenders against Saxon raiders.

Norfolk was the land of the Iceni, famous for the revolt against the Romans under Boudicca in 60 CE. Kessler has their descendants establishing a petty kingdom, *Caer Went*. The predominance of the Angles seems to be related to the land grant in Lincolnshire in the 440s. They were relatively few in number but were early players in the invasion and their lands in Lincolnshire combined with their presence on the coast of East Anglia, would have allowed them to build up their numbers and then encircle and conquer *Caer Went* over a 50-60 year period.

The key point about Kessler's maps is that by 475 CE, the Anglo-Saxon conquest was still in its early stages, with only Kent, London and Lincolnshire under their outright control and with them occupying the coasts of Yorkshire, East Anglia, the Essex side of the Thames Estuary and around the Isle of Wight. By 500 CE, they had overrun Norfolk, Sussex and penetrated deep into the Thames Valley, as far as Oxford, encircling the Celtic kingdom of Cynwidion in Northamptonshire.

Furthermore, the restriction of the presence of late 5th and early 6th century Byzantine pottery[52] (a prestige item) to Dumnonia, Southern Wales and isolated strongholds of the Britons such as Wroxeter points to a trading network which linked these areas to Armorica and ultimately to the Mediterranean, but which excluded not only Anglo-Saxon England, but also large areas still held by British petty kingdoms. Conversely, "Coptic" bronze vessels[53] of the same period, which are also Byzantine in origin, were found in notable concentrations in Kent, London, along the coast of East Anglia, and on the Rhine, with a particular concentration at the German-Swiss border.

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[51] http://www.historyfiles.co.uk/FeaturesBritain/BritishMapAD400.htm

[52] Pryor, op. cit., p. 182

In this light, the flight of many nobles (perhaps 50,000) from Dumnonia to Armorica in 458-60 is puzzling, since this area would not have seen much fighting and still had a viable trading network. Were these nobles fleeing from other parts of Britain? Would a group of Saxon mercenaries, however nasty and badly behaved (in the light of the massacre of British nobles 459) be more terrifying than Attila, who had been at the gates of Lutetia a decade before?

It also appeared that this trading route for luxury goods did more harm than good to the British side, as it was no doubt the entry portal for the plague in the 440s and again in the 540s.

The impression one thus gains is of a dysfunctional post-Roman Britain rotting from the inside and allowing a fairly small force of Anglo-Saxons to pick off petty kingdoms one by one. On the few occasions that the British were able to muster a competent general, they were able to repulse the invaders relatively easily.

We thus appear to have a situation which parallels the progressive displacement of Byzantines by Turks in the early Middle Ages, with the ranks of the latter constantly reinforced by nomads trickling in from the East, while the former found themselves with few places to run.

Härke nevertheless makes an interesting observation on the settlers in England which corroborates our 1:5 rule.

> Assuming that all, or most, of the men buried without weapons in the same cemeteries were natives, this implies that sites with diagnostically 'Anglo-Saxon' finds represent, in fact, ethnically mixed communities. This interpretation implies a proportion of Anglo-Saxon to British males of about 1:1 for Anglo-Saxon communities in southern England. Local and regional British enclaves can be expected to add the same number again of Britons, or even double that, giving an overall proportion of 1:2 or 1:3 in the southern settlement areas. For the north, a significantly higher proportion of natives has to be assumed, although against the background of a lower population density. It is virtually impossible to take both factors accurately into account, but they should tilt the numerical proportions further in the favour of the native British male population to approximately 1:4 or more for the entire Anglo-Saxon settlement area. It should be borne in mind that this model ultimately rests on the skeletal and archaeological data from eight key sites, with the results then applied to a wider sample of 47 sites.[54]

And since his estimates are based on cemetery data, there is no reason to reject them. If we assume an initial invasion phase from 440-475 CE, representing the conquest of Kent, part of Lincolnshire, the area around London and the Thames Estuary, as well as the coast of Norfolk (c. 10,000 km^2) and then a second phase from 475-500 CE which extended territory controlled to the whole of the South East and East Anglia minus Essex plus half of Lincolnshire (an area of around 40,000 km^2), then assuming that this area probably had a higher population density than the average of England and Wales in 400 CE, say 7-8 inhabitants/km^2 which had then been reduced by disease, famine and migration to 6 inhabitants/km^2 by this period, the territory conquered in the first phase would have had a native population of around 60,000, while the territory added in the second phase would have had a native population of around 240,000.

To achieve a ratio of immigrants/natives of 1:2 or 1:3 would have required 20-30,000 migrants, with a further 60-90,000 between 475 and 500 CE. Härke suggests that 50 to 100 boats operating during the summer could have ferried 200,000 people across the North Sea in a century.

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[53] Pryor, op. cit., p. 179

[54] H. Härke, *op. cit.*

On this basis, the first phase would have taken 10 years. Against this, if we consider the one sea crossing involved in the Völkerwanderung, the transport of 80,000 Vandals across the Strait of Gibraltar (14 km) in around 3 months in 429 CE, in boats which they had built themselves or commandeered, then assuming that each boat transported 25 people a day over 90 days, the Vandals would have required fewer than 40 ships.

By comparison, if a ship could transport 25 men across the North Sea in 6 days and could sail 10 times in a season, then if the invaders could assemble a fleet of 100 ships there is no need to posit more than a year or two for transporting the necessary troops to Britain.

Furthermore, if Pattison's hypothesis regarding the Belgae is correct, then there would already have been 5% of 800,000 = 40,000 Germanic speakers in situ, plus 10,000 descendants of foederati. The number of migrants from the Continent during this period could thus have been as low as 30,000, although the true figure was probably higher.

If we then assume that immigration slowed to a trickle during 500-550 CE before accelerating thereafter, the number of inhabitants of the British areas would no doubt have fallen further due to an even more ferocious plague epidemic and continuing emigration. Given the by now consolidated presence of the Anglo-Saxons, it is unlikely that as many new immigrants were required to complete the conquest in the 6th and 7th centuries.

But what language did they speak? Forster, Polzin & Röhl carried out a phylogenetic analysis of 100-item Swadesh lists[55] including lists for Old English drawn from Beowulf and the King Alfred Bible, and found a hybrid Scandinavian/continental German inheritance, as well as words specific to Old English which led them to conclude that there was an archaic component to English.

The main problem with this kind of analysis appears to lie in the fact that Forster et al. chose a single word for each entry on a Swadesh list for a given language but when one looks closely, one finds that the apparently isolated word has cognates in a variety of languages. Take 'small': which in Forster et al.'s analysis appears as a modern English anomaly absent from all of their wordlists for extinct languages. It is actually present in many Germanic languages: ON *smalr*, OHG *smal* (slender), even in Gothic *smals*. Alfred *suira* 'neck' is not an OE isolate, but is actually present in Old Norse as *sviri*. *Steort* 'tail' appears from their list to be specifically cognate with Frisian *stert*, but is actually general: ON *stertr*, MLG *sterz*. The same is true of *wamba* (belly).

My analysis of the Romance Swadesh lists in MTXIII was specifically an analysis of *differences* which showed that the 'new words' in the modern Romance languages were actually present in Vulgar Latin. If anything, the core vocabulary of the Germanic languages is so homogeneous and so poorly attested in its earlier stages that it is difficult to carry out an analysis with the same degree of resolution as for the Romance languages.

We can nevertheless show that even the specifically 'Modern English' forms in Forster et al.'s list were all present in Old English: **Neck:** OE *hnecca* (nape of neck), ON *hnakki* , OHG *hnac*, West Frisian *nekke*; **Black:** OE *blœc* (perhaps from 'burned'); **Bird:** OE *brid* (young bird); **Know**: OE *gecnāwan*, OHG *ir-cnāan*; **Dog:** OE *docga*; **Cloud:** may be later, but derives from OE *clūd* – in the sense of 'mass of something, clod'; **Kill:** OE *cwellan* cognate with German *quälen* (to torment).

We have also seen that the assumption of a homogeneous Vulgar Latin surviving well into the early Middle Ages based on an analysis of written texts, entirely obscures the real inheritance of dialectal forms present from the earliest days of the Empire. Likewise, the conventional conclusion drawn from meagre runic inscriptions is that the whole of Scandinavia spoke a largely uniform proto-Old Norse which subsequently differentiated into Old Swedish, Old Danish and Old Norwegian. In the light of our Latin evidence, however, can we take this conclusion at face value, since Gothic lurks in the background of Scandinavian prehistory? We know, for example, that the Burgundians, whose ancestral homeland is traditionally attributed to the island of Bornholm, spoke a language related to Gothic. The Lombards, whose language is extremely poorly attested but appears to be closest to Saxon, are also attributed a Scandinavian homeland prior to settling on the lower Elbe. In other words, much of the Germanic family may map into Scandinavia. While the Goths and Lombards had supposedly left Scandinavia 700-1,000 years before the Germanic invasions of Britain, is it not possible that there was a residual substrate of such languages? Indeed, the Geatish Wuffings of East Anglia, who were the most powerful dynasty in England from the mid-sixth to mid-eighth century, came from Östergötland. Conversely, if many Germanic tribes originated in Scandinavia but then migrated to Northern Germany/Poland etc., it follows that these continental (as opposed to Scandinavian) varieties of German languages will also have a Scandinavian inheritance.

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[55] Forster, P., Polzin, T. & Rohl, A., *Evolution of English Basic Vocabulary within the Network of Germanic Languages*, in Phylogenetic methods and the prehistory of languages, Cambridge, 2006.

A full consideration of the evidence is evidently beyond the scope of this article, but even Forster et al.'s data illustrates the hybrid inheritance of Old English and the existence of dialectal diversity. It must be said that his raw material is not very promising. The Alfred Bible probably represents a text written in a relatively faithful rendering of Wessex dialect from the start of the 10th century. The extant text of Beowulf, on the other hand, while no doubt of East Anglian (and ultimately Scandinavian) origin, is probably a mid-11th century patchwork quilt of dialects. In this way, we must constantly ask whether the items in Beowulf which are clearly of Scandinavian origin originate with the Angles and Jutes of the 5th century, or are later Viking imports such as *stōr* (big).

With this proviso, we can analyse a number of items on the Swadesh lists which shed light on the origins of Old English.

Sleep: *swefan* in Beowulf but *slæpan* in King Alfred: The former is evidently cognate with *sofa* in Old Norse, the latter with *slapan* in Helioland (Old Saxon, 830-40CE), *slepan* in Gothic. I think that we can safely attribute a Scandinavian origin to *swefan* since it differs from OSax *sweban.* Furthermore, since ON has *sofa*, *swefan* is likely to be a pre-Viking form, since otherwise, it would not have preserved the glide. *Slæpan* is cognate with Frisian *slēpan*, OSax *slāpan.*

Mountain: *fyrg* in Beowulf, which is only cognate with Gothic *fairguni* but *munt* in Alfred (probably a borrowing from British – cf. Welsh *mynydd*), as against West Germanic cognates of NHG *Berg* and ON *fjall*. *fyrg* is the most tantalising etymology of all, since despite ON *fjorgyn* (mother earth), only Gothic gives a good match. Does this indicate that there was a Gothic substrate in the dialects of the Geats who settled East Anglia?

Egg: not extant in Beowulf, but *æg* in Alfred – points to Scandinavia cf. ON *egg*, since W. Germanic languages have all lost the final *–g*.

Mouth/Tooth: *muÞ* in both Beowulf and Alfred, *toÞ* in Beowulf, not reported in Alfred. We have OSax *muth*, Ferring (Frisian – Föhr) *mös*, Frash (Frisian –W. Schleswig) *müs*, although other Frisian forms are cognate with German *maul* and therefore not helpful. This appears to be a specifically Saxon import since Norse, Gothic, German and Dutch all maintain the medial n (e.g. Dutch *tand*, *mond*). It is evidently tempting to conclude that Swiss German *föif*, Swabian *feif* are parallel forms which correlate with the distribution of Coptic vessels along the Rhine cited above, with a particular concentration in N Switzerland and in Kent/London, but Nielsen reports claims that the Alemannic forms are parallel, later developments.[56]

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[56] Nielsen, H.F. *The Germanic Languages*, Tuscaloosa/London, 1989, p. 133.

> **Give:** Beowulf *gifan* but Alfred *sellan*, probably from Old Frisian *sella* (hand over, sell), but also present in ON *selja* (hand over, sell). Nothing very mysterious here.
>
> **Say:** Beowulf *secgan* (general Gmc) but Alfred *cweÞan*. *cweÞan* is also general Gmc: ON *kveða*, Gothic *qiÞan* but OFris *quetha*, OSax *quethan*. The Alfred form looks closer to Frisian/Saxon.
>
> **Night:** no obvious explanation for the *i* vowel.

On the basis of our Latin model, this hybrid inheritance is exactly what we would expect. Indeed, since the Romans had been inviting *foederati* from Denmark and Frisia for generations before the actual invasion word would no doubt have spread from the Saxons through their trading networks all along the Rhine and into Scandinavia that Britain offered rich pickings.

But what of the 'Frisianised' Germanic language of the Belgae spoken in Roman Britain or even pre-Roman Britain? We can certainly find voiced initial fricative forms in Middle Kentish dialect *vader*, *verste*, *zelve*, *zoÞe; Þe*, *Þyef*) which parallel Middle Dutch *zegghen*, *zo*; *daer*, *dief*.[57] Nielsen describes a consensus that these changes are old, but it seems impossible to date them specifically to Roman times. Again, this is not to deny its existence, merely that it cannot be empirically demonstrated on the basis of the data considered.

4. Northern India

Finally, if this 1:5 ratio is valid, it offers an intriguing hypothetical solution to the mystery of the Indus Valley.

Indeed, McEvedy notes:

> By 2000 BCE, when the Indus Valley civilisation, usually named after one or other of its two chief towns, Mohenjo-Daro and Harappa, reached its full flowering, there were possibly 5 million in the Indus Valley, as against 1 million in the still Mesolithic remainder of the subcontinent.[58]

Unless one assumes that the Mesolithic remainder was already Indo-European speaking or that there was a comprehensive die-off of the Indus Valley civilisation, both of which seem extremely unlikely, the source of the spread of the Indo-European language to the Ganges Valley must have been the Indus Valley. Indeed, economic and social problems in the Indus Valley region would have triggered a migration to what would then have been a peripheral area. In this way, whatever the predominant language of the Indus Valley, the inhabitants of the North of India from Punjab to the mouth of the Ganges are now speaking its daughter languages.

No doubt, the South of India was less primitive and less underpopulated by Dravidians than McEvedy claims, but the fact remains that Northern and Central India is dominated by Indo-Aryan languages.

Interpolating from McEvedy's data, we would also have contemporary populations of 1m in Iran, probably 300-400,000 in Afghanistan and only 100-200,000 in Central Asia.

The implication is clear here. Assuming that the Indus Valley was non-Indo-European speaking, our 1:5 ratio suggests that Iranians would have struggled to convert it to Indo-European at the beginning of the 2nd millennium BCE, and a population originating from Afghanistan or

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[57] *Idem*, p. 144

[58] McEvedy, op. cit., p. 182

Central Asia was simply not large enough for the task. The most logical explanation is that the Indus Valley itself was already predominantly Indo-European speaking. This is not to suggest that it is the cradle of Indo-European, merely that the demographic evidence militates against a sudden appearance of Indo-European in tandem with the collapse of this civilisation.

MOTHER TONGUE
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In Memory of Daniel F. McCall

Proto-Indo-European ‘Horse’ From a Nostratic Perspective

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One of the benefits that should be gained through the Nostratic hypothesis is the ability to offer insights into various aspects of the Nostratic daughter languages that are not possible or not obvious from the internal evidence of the individual daughter languages alone. In this brief paper, I would like to explore one such insight.

The Proto-Indo-European word for ‘horse’ is traditionally reconstructed as **ek̂u̯o-s*. It is abundantly attested in the various Indo-European daughter languages: Sanskrit *áśva-ḥ* ‘horse’; Avestan *aspa-* ‘horse’; Old Persian *asa-*, (Median) *aspa-* ‘horse’; Mycenaean *i-qo* (*hiqqo-*) ‘horse’; Greek ἵππος ‘horse’; Latin *equus* ‘horse’; Venetic (acc. sg.) *ekvon* ‘horse’; Old Irish *ech* ‘horse’; Gothic **aiƕa-* ‘horse’ in **aiƕatundi* ‘bramble, prickly bush’ (literally, ‘horse-thorn’); Old Icelandic *jór* (< **eχwaʀ* < **eχwaz*) ‘stallion, steed’; Old English *eoh* ‘horse’; Old Saxon *ehu-* horse’ in *ehu-skalk* ‘horse-servant’; Lithuanian *ašvà* (Old Lithuanian *ešva*) ‘mare’; Tocharian A *yuk*, B *yakwe* ‘horse’, B *yäkwaṣke* ‘little horse’; Hieroglyphic Luwian *á-sù-wa-* ‘horse’; Lycian *esbe-* ‘horse’.

Hittite, however, has **ekku-* ‘horse’, typically rendered in Sumerograms as (nom. sg.) ANŠE.KUR.RA-*uš*. As pointed out by Kloekhorst (2008:237—239), the Hittite form points to an earlier *u*-stem noun in Proto-Indo-European **ek̂-u-s*. This must have been the original form, and the forms found in the remaining daughter languages must have been derived from this form through the addition of the thematic vowel *-*o*-, thus: **ek̂-u-* + *-o-* > **ek̂-u̯-o-*.

Though attempts have been made to compare the Proto-Indo-European word for ‘horse’, **ek̂-u-s*, **ek̂u̯o-s*, with the Proto-Indo-European word for ‘quick, swift’, **ōk̂-u-s* (as seen, for example, in Sanskrit *āśú-ḥ* ‘quick, swift’; Greek ὠκύς ‘quick, swift, fleet’; etc.), the lengthened-grade vowel in the latter form is problematic. Adding laryngeals to the reconstruction only adds to the difficulties (**ōk̂-u-s* ‘quick, swift’ < **HoHk̂-u-s*), for it is impossible to tell on the basis of the evidence from the daughter languages which laryngeals are involved. The initial laryngeal in the word for ‘horse’, however, can only have been *H_1, which is often interpreted as a glottal stop /ʔ/ (so, for example, Kloekhorst 2008:237—239, who reconstructs Proto-Anatolian **ʔeḱu-* ‘horse’). The problems involved notwithstanding, the comparison of the word for ‘quick, swift’ with the word for ‘horse’ has led to the assumption that the word for ‘horse’ originally meant something like ‘the swift one’. However, another possibility presents itself when other Nostratic languages are brought into consideration.

Let us now look at Altaic, especially the Mongolian branch. Starostin—Dybo—Mudrak (2003:499) reconstruct Proto-Altaic **èkʻá* ‘to paw, to hit with hooves’ on the basis of the following forms:

a) Proto-Tungus **ekte-* ‘to paw, to hit with hooves (horse); to rough-house; to faint’ > Manchu *ekte-* ‘to paw, to hit with hooves (horse); to rough-house’; Udihe *ektine-* ‘to faint’.
b) Proto-Mongolian **(h)agsa-* ‘to have fits, convulsions; to fling fiercely; to chafe, to behave nervously (of a horse); to rough-house; feeling of weariness (from physical labor)’ > Written Mongolian *aγsur-* ‘to storm, to fly into a rage, to be violent or furious; to be fiery’, *aγsum* ‘(n.) fury, rage, madness; (adj.) furious, fiery, violent, tempestuous, spirited’, *aγsum mori* ‘fiery or spirited horse’, *aγsumna-* ‘to rage, to storm, to behave violently; to bluster, to be boisterous; to debauch’; Khalkha *agsam* ‘(n.) fury, rage; (adj.) furious, raging; fiery, spirited’, *agsamnax-* ‘to rage (of a drunken person); to be furious; to dash ahead (of a horse)’, *agsan* ‘furious, raging (of a drunken person)’, *agsan mori* ‘fiery, mettlesome horse’, *agsčix* ‘to be fiery all the time (of a horse); to continually rage’; Buriat *agšan* ‘frolicsome, prankish’, *agsam* ‘rampage, rage, raging’; Kalmyk *agsra-* ‘to chafe, to behave nervously (of a horse); to rough-house’, *agsag* ‘wild’; Ordos *agsur-* ‘to fling fiercely’, *agsum* ‘wild, raging’.
c) Proto-Turkic **agsa-* ‘to hobble, to limp; lame’ > Karakhanide Turkic *axsa-* ‘to hobble, to limp’, *aqsaq*, *aγsaγ* ‘lame’, *aχsuŋ*, *axsum* ‘rampage, rage, raging’; Turkish *aksa-* ‘to hobble, to limp’; Azerbaijani *axsa-* ‘to hobble, to limp’; Turkmenian *aɢsa-* ‘to hobble, to limp’; Uzbek *ɔqsa-* ‘to hobble, to limp’; Tatar *aqsa-* ‘to hobble, to limp’; Bashkir *aqha-* ‘to hobble, to limp’; Kirghiz *aqsa-* ‘to hobble, to limp’; Kazakh *aqsa-* ‘to hobble, to limp’; Karachay-Balkar *aqsa-* ‘to hobble, to limp’; Kara-Kalpak *aqsa-* ‘to hobble, to limp’; Kumyk *aqsa-* ‘to hobble, to limp’; Noghay *aqsa-* ‘to hobble, to limp’; Sary-Uyghur *axsa-* ‘to hobble, to limp’; Khakas *axsa-* ‘to hobble, to limp’; Tuva *asqa-* ‘to hobble, to limp’; Yakut *axsɨm* ‘lame’.
d) Proto-Japanese **ànkà-k-* ‘to paw (the air); to struggle, to strive’ > Old Japanese *agak-* > Middle Japanese *àgàk-* > Tokyo *agák-*; Kyoto *ágák-*; Kagoshima *àgàk-*.

Starostin—Dybo—Mudrak note that the Turkic forms may be loans from Mongolian and that both the Turkic and Mongolian branches have derivatives meaning ‘rampage, rage, raging’.

As an aside, it appears to me that it is possible to improve upon the meanings assigned to the proto-forms reconstructed by Starostin—Dybo—Mudrak. For Proto-Altaic **èk‘á*, I propose the meanings ‘to move quickly, to rage’; for Proto-Tungus **ekte-*, ‘to make rapid movements’; and for Proto-Mongolian **(h)agsa-*, ‘to move quickly, to rage; to be furious, raging, violent, spirited, fiery, wild’. These changes take into consideration the derivatives meaning ‘rampage, rage, raging’. Though cited separately by Starostin—Dybo—Mudrak, these forms are key to determining the original semantics, and, consequently, they have been fully incorporated into the etymologies given above.

In his recent book, Anthony (2007:196—197) describes the behavior of wild horses as follows:

> Wildlife biologists have observed the behavior of feral horse bands in several places around the world, notably at Aksania Nova, Ukraine, on the barrier islands of Maryland and Virginia (the horses described in children's classic *Misty of Chincoteague*), and in northwestern Nevada. The standard feral horse band consists of a stallion with a harem of two to seven mares and their immature offspring. Adolescents leave the band at about two years of age. Stallion-and-harem bands occupy a home range, and stallions fight one another, fiercely, for control of mares and territory. After the young males are expelled they form loose associations called "bachelor bands," which lurk at the edges of the home range of an established stallion. Most bachelors are unable to challenge mature stallions or keep mares successfully until they are more than five years old. Within established bands, the mares are arranged in a social hierarchy led by the lead mare, who chooses where the band will go during most of the day and leads it in flight if there is a threat, while the stallion guards the flanks or the rear. Mares are therefore instinctively disposed to accept the dominance of others, whether dominant mares, stallions — or humans. Stallions are headstrong and violent, and are instinctively disposed to challenge authority by biting or kicking. A relatively docile and controllable mare could be found at the bottom of the pecking order in many wild horse bands, but a relatively docile and controllable stallion was an unusual individual — and one that had little hope of reproducing in the wild. Horse domestication might have depended on a lucky coincidence: the appearance of a relatively manageable and docile male and a place where humans could use him as the breeder of a domesticated bloodline. From the horse's perspective, humans were the only way he could get a girl. From the human perspective, he was the only sire they wanted.

The behavior of wild horses described by Anthony could not have been lost on the humans who encountered them on the Eurasian steppes. This behavior is clearly indicated in the Altaic terms cited above, as in Written Mongolian *aγsur-* 'to storm, to fly into a rage, to be violent or furious; to be fiery', *aγsum* '(n.) fury, rage, madness; (adj.) furious, fiery, violent, tempestuous, spirited', *aγsum mori* 'fiery or spirited horse' or Khalkha *agsčix* 'to be fiery all the time (of a horse); to continually rage'.

Let us now propose that Proto-Altaic **èk'á* 'to move quickly, to rage' is to be compared with the Proto-Indo-European word for 'horse', **eḱ-u-s*, **eḱu̯o-s*. Thus, by bringing the Altaic material into consideration, the original meaning of the Proto-Indo-European word for 'horse' becomes clear. It did not mean 'the swift one' but, rather, 'the spirited, violent, fiery, or wild one'. This could not have been seen on the basis of the Indo-European evidence alone. Both the Proto-Altaic and the Proto-Indo-European forms are to be derived from a Proto-Nostratic root **ʔek*^{h}*-* 'to move quickly, to rage; to be furious, raging, violent, spirited, fiery, wild'.

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In Memory of Daniel F. McCall

Indo-European-North Caucasian Isoglosses[1]

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To the North Caucasian languages we assign, following N. Trubetskoy (Trubeckoj 1930), two language families: Northeast Caucasian (with the Lezgi, Tsez, Andi, Lak and Nakh subgroups; separate subgroups are defined by the Dargi, Lak, Khinalug and Avar languages, of which Avar specifically is close to the Andi languages, forming together with them an Ando-Avar unity); and Northwest Caucasian (with the Abkhaz-Abaza and Adygh subgroups, and the Ubykh language forming a separate subgroup). At the present time, following the works of I. M. Diakonoff and S. A. Starostin (D'jakonov and Starostin 1988) and V. V. Ivanov (Ivanov 1984), likewise with a high degree of certainty one may assign to Northeast Caucasian the Hurro-Urartian languages, and to the Northwest Caucasian languages the Hattic language (although the position of the latter is not yet fully clarified: quite possibly it may not fit directly into the makeup of the northwest Caucasian languages, but rather form with them a unity not unlike the Ando-Avar unity.

The progress achieved at present in the field of the comparative-historical phonetics of the North Caucasian languages[4] enables us to enlist North Caucasian data for various types of researches in the field of genetic and areal connections among the languages of the Caucasus (earlier this was difficult due to the extensive restructuring of the phonetic systems of the present-day North Caucasian languages, as a result of which the necessity for accurate North Caucasian reconstructions was especially sharply felt). In the present work we attempt to analyze the interrelationship of the North Caucasian and Indo-European languages.

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[3] The author expresses deep indebtedness to V.A. Dybo, Vyach. Vs. Ivanov and V.È. Orel for reviewing the manuscript and offering a number of valuable observations.

[4] The foundations of the comparative-historical phonetics of the North Caucasian languages were laid in the classic works of N. Trubetskoy (Trubeckoj 1922; 1926; 1930; 1931). During the past twenty years many valuable researches in this field have appeared: it is sufficient to cite the works of T.E. Gudava (1965), V.K. Gigineishvili (Giginejšvili 1977), B.B. Talibov (1980), A.I. Abdokov (1976; 1983), D.S. Imnaishvili (Imnaijšvili 1977), A. Kuypers (1963; 1975), A.K. Shagirov (Šagirov 1977). The author of the present work together with S.L. Nikolaev produced a number of reconstructions of intermediate proto-language states (Proto-Lezgian, Proto-Tsezian, Proto-East Caucasian, Proto-West Caucasian) and put forward a new variant of North Caucasian reconstruction. At the present time an etymological dictionary of the North Caucasian languages, incorporating some 800 common North Caucasian roots (and as well about 2000 separate East Caucasian and west Caucasian lexical reconstructions) is being prepared for publication.

The absence of a genetic relationship between the North Caucasian and Indo-European languages is obvious: in the basic lexicons of these languages no correspondences of whatever sort exist, and the phonological and morphological systems differ fundamentally as well. Consequently, if we encounter resemblances of vocabulary between the North Caucasian and Indo-European languages (whether in their present stage of development or in their reconstructed states) the discussion clearly must be about borrowings.

Chronologically the most recent stratum of "Indo-Europeanisms" in the North Caucasian languages consists of numerous borrowings from contemporary Russian. The stratum preceding it consists of Iranianisms (borrowed from middle Persian and modern Persian, and also from Ossetian), these having penetrated the North Caucasian languages starting in the earliest centuries of the Christian era. Also to be noted is the large number of Armenianisms in the Udi language (Lezgian subgroup), several of which spilled over into the neighboring Lezgian languages (cf. Vinogradova and Klimov 1979). All of these borrowings, as a rule, are easily identified, and we will not be dwelling on them (although they without doubt constitute a needed field of research).

Of far greater interest are the instances of "Indo-Iranianisms" in the North Caucasian languages. Borrowings from some ancient Indo-Iranian language (languages?) are evident in the East Caucasian languages — although in a comparatively small number — of which the following examples testify:

1) **PEC _*u̯aran-/ *u̯aral-_ 'camel':** Av., Lak _warani_, Darg. _walri_, Lezg. _lawar_; **OInd. _varaṇa-_ 'camel'** (see Klimov 1971, 228).

2) **PEC _*vĕlθi_**[5] **'thick felt, felt cloak':** Arch. _warti_, Tab. _verč_, Lezg. _lit_, Darg., Ak. _warhi_, Chir. _warse_, Lak _warsi_, Av. _burtina_, Chech. _werta_, Ing. _ferta_ and so on; **Avest. _varəsa_ 'hair (single strand)'** PIE _*u̯olk̂o-_, cf. also OInd. _valça-_ 'fleeing, branching off', OSl. _vlasъ_ etc., see _WP_: I, 297—see Klimov 1972, 354 (Kartvelian parallels are found there as well, for which the author presumes an East Caucasian source).

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[5] The phoneme _*θ_ is reconstructed only for PEC and in a very small number of roots (apparently not ancient).

3) **PEC *werše* 'bull-calf, male calf; male':** Av. *basi* 'calf, Akhv. *buša*, Tind. *boha* 'bull', Chech., Btsb. *borš* 'bull'; Chech. *börša* 'male', Arch. *boš-or* 'husband, man'; cf. as well Ur. *wâšə* 'people, men'; **OInd. *vr̥ṣa-* 'ox', *vr̥ṣan-*, *vr̥ṣṇí-* 'male', Avest. *varəšna-* 'male':** PIE **u̯ers-*, cf. Lat. *verrēs* 'wild boar', Lith. *veȓšis* 'calf', Latv. *versis* 'ox' (*WP*: I, 269). The Indo-European root usually is considered a verbal (cf. OInd. *varṣati* 'to be rainy', Gk. οὐρέω < **u̯ors-ei̯ō* 'to wet'), but cf. the Nostratic etymology (Dolgopolsky 1974, 171); in any case the direction of borrowing (from Indo-European to East Caucasian) raises no doubt here.

4) **PEC *wVt̄VrV* 'young one (up to 1 year)':** Tsakh. *vudra* 'kid up to one year'), Tzez. *beduro* 'bear cub', Btsb. *bader*, Chech. *bēr* 'child', and others; **OInd. **vatara-* in *sa-vātara-* 'having that very calf':** PIE **u̯etero-*, cf. also Germ. **wiÞru-* 'year-old lamb; ram').[6] The Indo-European formation derives from PIE **u̯et-* 'year; old' (for the Nostratic etymology see *MSSNJa*: 337).

5) **PEC *bārzV* 'mountain, hill':** Hunz. *bɨzu*, Bezht. *bizo* 'mountain', Chech. *barz*, Ing. *boarz* 'hillock, knoll, mound', Lezg. *barza* 'high-mountain meadow'; **OInd. *br̥hant-* 'high', Avest. *bərəzant-*, *bərəz-* 'high, mountain', Pers. *burz* 'mountain':** PIE **bherĝh-* 'high, to rise, to tower', from whence also Arm *barjr* 'high'; cf. Irish *bri* 'hill', OHG *berg* 'mountain', Slav. **bergъ* 'bank (of a stream)', Hitt. *parku-* 'high' and so on. For a reliable Nostratic etymology of the PIE root see Illich-Svitych 1971, 177. Besides the above-enumerated East Caucasian forms, Lak *barzunt̄iw* 'heights, mountains' corresponds exactly, apparently, to the Indo-Iranian participle form in *-nt* (see above).

6) **PEC *mäIdwV* [7] 'a kind of drink':** Lez. *med*, Tab. *med*, Dyub. *maIj* 'syrup', God. *medi*, Bagv. *mer* 'beer, bouza'; compare also Lak (Bartx. dialect) *maId* 'sperm'; **OInd. *madhu-* 'honey', Avest. *maδu* 'wine from berries':** PIE **medhu-* 'honey'; on the etymology of this root see below, 5.14).

With time, probably, it will become possible to enlarge this list somewhat.

That there would be an absence of old Iranianisms in the West Caucasian languages was presupposed by N. Trubetskoi (Trubeckoj 1921). Most of his etymologies were submitted to a critique, conducted quite fairly, by G. Dumézil (Dumézil 1963).

In his turn, however, Dumézil in that work proposed Indo-European etymologies for a number of West Caucasian bases, but it is difficult, nevertheless, to agree with the majority of them; several of them will be examined below. On the whole we must maintain that so far any hopeful Indo-Iranian etymologies for whatever West Caucasian roots are lacking.

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[6] Eng. *wether*, also in *bell-wether*. [Ed.]

[7] Note: the symbol /I/ in these words is not the high front vowel, as might be expected. It is the *paločka*, a convention of Russian caucasology that indicates a pharyngealized vowel or consonant. Thus /äI/ represents the vowel /ä/ with a pharyngeal quality, /aI/ is pharyngeal /a/, etc. [Ed.]

However, if we depart from the list of more or less late "Indo-Europeanisms" in the North Caucasian languages enumerated above, there still remains a very large group of lexical coincidences between PEC and PIE, the majority of which, as far as we know, have not figured in the specialized literature. To begin with we introduce a list of these instances, and then we attempt to offer corresponding linguistic commentaries.

1. NAMES OF ANIMALS

1.1. **PIE **(H)aiĝ-* 'she-goat':** Gk. αἴξ, Arm. *aic*, Alb. *dhi* < **aiĝiiā* 'she-goat', Avest. *īzaena-* 'leathern' (see *WP*: I, 8); a variant of that root is, in all probability, PIE **(H)aĝ(o)* 'she-goat, he-goat': Old Ind. *aja-* 'he-goat', *ajā* 'she-goat', cf. Pers. *azak* 'she-goat', Lith. *ožȳs*, Latv. *âzis* 'he-goat', Old Prus. *wosee* 'she-goat'; Alb. *edh* 'she-goat', Old Sl. *azno* (**azъno*) 'she-goat' (cf. *WP*, I, 38)[8]; **PNC **Hējʒ́u* 'she-goat, he-goat':** Darg. Ak. *ʕeža*, Chir. *ʕač̄a* 'she-goat'; PN **ʔāwstV* 'she-goat up to 1 year of age' > Chech., Ing. *oasta*; PAK **ač̄á* 'he-goat' > Adyg. *āča*, Kab *āža*. For a comparison of the Adyg and Indo-European material (but without involving the East Caucasian data) see Dumézil 1963: 13.

1.2. **PIE **eḱu̯o* 'horse':** OInd. *açva-*, Gk. ἵππος, Lat. *equus*, OIr. *ech*, Old Eng. *eoh*, Lith. *ašvà*, OLith. *ešva* 'mare', Hier. Hitt. *aśuwa-* and so on, see *WP*, I, 113; **PEC **ħīnčwV* 'horse':** PL **ħɨnš*^{w} > Arch. *nolš* 'horse', Lezg. *šiw* 'steed', Khin. *pši*, Darg. *urči*, Lak *č*^{w}*u*, Av. *ču*; PA **ʔič*^{w}*a* > Akhv. and Tind. *ič*^{w}*a*, And. *iča* and so on; PWC **č́*^{w}*ə* > Abkh. *a-čə́*, Ub. *č́ə*, Ad. *š́ə*, and Kab. *šə* 'horse'; cf. also Hurr. *eššə* 'horse'.

Besides the Indo-European form one can note as well Sum. *anšu*, *anše* 'donkey, ass' = Proto-Lezg. **ħɨnš*^{w} (that the Sumerian word is a borrowing is indicated by its irregular vocalism —a feature impossible in the native Sumerian lexicon). "Mediterranean" names for the ass (Gk. ὄνος < **ohono-s* < **osono-s*, Lat. *asinus* 'ass'), all of which Arm. *eš* 'ass' hints at (cf. *WP*, ibid.), have, no doubt, a Hurro-Urartian source of the type **eššə-nə* (with a typical postpositive formation in *-n-*[9]).

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[8] The PIE variants **(H)aiĝ-* and **(H)aĝo-*, the correlation of which within Indo-European is inexplicable, could in principle be due to their having arisen simultaneously as a borrowing from Proto-East-Caucasian (or, possibly, as a borrowing from several dialects which had differentiated among themselves). Concerning the etymological source of the Albanian names for 'she-goat' and 'goat-kid' see Orël 1984.

[9] The morpheme *-nə* in Hurro-Urartian plays the role of a definite article and therefore very frequently determines the shape of nouns. Historically it goes back, apparently, to a Proto-East Caucasian (and, possibly, to a Proto-North Caucasian) indicator of an oblique noun base **-nV*, well represented in contemporary East-Caucasian languages (in West Caucasian only relic formations with this formant

1.3. **PIE **kaĝo- (~-o-)* 'goat, she-goat':** OSl *koza, kozьlь*; OEng. *hēcen*, cf. OLG. *hōken* 'goat (dim.)' (with an unclear vowel lengthening), Goth. *hakuls*, OLG. *hachul* 'coat (article of clothing)' (< 'leathern'), Alb. *kedh, kec* 'kid'; (see Toller 1921, 526; Feist, 238-239): **PEC **q̇oIcV* 'goat, she-goat, kid'[10]:** Lezg. *ʁeç* 'kid', Darg., Lak *q̇aIca* 'he-goat'; Hunz. *q̇asa* 'hornless animal' also, apparently, belongs here.

1.4. **PIE **kol(i)-* 'puppy, cub, whelp; young one':** Gk. σκύλαξ, Hes.[11] κύλλα 'puppy, cub, whelp; young one'; Lith. *kãlė, kalẽ* 'bitch', Alb. *këľüš* 'young one; puppy, cub, whelp', cf. Irish *cuilēn* (**koli-gno-* 'young one', *WP*: I, 445; Frisk II, 741; Fraenkel, 208); **PEC **q̇VIV* 'young one':** Lak *q̇uli* 'young one'; PTs. **q̇əra* 'child; infant' > Khvar. *q̇ale*, Inkh. *q̇ala*, Georg. *q̇əra*, Bezht. *q̇owa*, Tl. *q̇ora*.

The comparison is admissible if in PIE the original meaning is in actuality 'puppy, cub, whelp; young one' (the morphological structure of the formations presented do in principle permit one other explanation).

1.5. **PIE **dik-/dig-* 'she-goat':** OHG. *ziga* (base in *-n-*) 'she-goat', OEng. *ticcen*, OGerm. *zickīn* (< **tiknīn-*) 'she-goat (dim.)', Arm. *tik*, Gk. Hes.* δίζα 'she-goat', *WP* I, 814; Frisk: I, 390-391; **PEC **ƛ̄Vq̇V* 'he-goat, kid':** PTS **ƛ̄iq̇*^{w}*ə* 'goat kid up to 1 year' > Inkh. *ƛ̄iq̇o*, Bezht. *ṭöq̇ä*, Hunz. *ṭoq̇-či*, Av *deˤen* (< **deq̇en*) 'he-goat'; possibly belonging here as well is Hurrian *taγə* 'man (male person)': D'jakonov and Starostin 1988.

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survive). It is very likely that in PEC and PNC the morpheme **-nV*, besides indicating an oblique base, also played the role as well of an indicator of definiteness.
Attention is directed to the fact that among the Indo-European lexemes examined in the present work rather a large number of them have a suffixal prevalence of *-*n*-, of which fact examples 2.10 (**pērs-nā*), 2.14 (**stom-en-*), 2.15 (**s/p/elĝh-en-*), and 3.14 (**bharsĭ̄no-)* testify: as for the identity of the latter, namely PEC **bVrč̣-inV*, see below 3.14; 3.23 (**(H)enk*^{w}*-no-* > Slav.**ęčьnъ*, Gk. ὄμπνη), (**(H)enk*^{w}*-no-* > **ęčьnъ*, Gk. ὄμπνη), 4.10 (**g*^{w}*erə-n-*), 5.6 (**u̯es-no-*). Compare as well the heteroclitic bases 2.2 **li̯ek*^{w}*-r̥/*li̯ek*^{w}*-no-* and 5.11 **k̂ek*^{w}*-r̥-/*k̂ek*^{w}*-no-*, upon which the nominative shape could have been developed still later, following the Indo-European model of that time.

[10] Many of the examples introduced in the present article are based only on East Caucasian data (separate West Caucasian -Indo-European isoglosses exist as well, but in a very small number: see examples 4.1, 4.15, 5.13). This, however, hardly speaks of any specific ties between PEC and PIE. It is more likely that we are dealing here with roots the reflexes of which in the West Caucasian languages have been lost. The fact is that the specific character of the contemporary West Caucasian languages (just as with reconstructed PWC) has resulted from a sharp contraction of the number of roots in general on account of an extraordinary development of root composition, such that many of the original roots are now lost, having been replaced by periphrastic formations of various types. This, in part, explains the quite small common root stock of the West Caucasian languages (splendidly supplying, however, a large part of the lexemes in the contemporary West Caucasian languages) and the comparatively small number of reconstructed PNC roots (around 800 out of more than 2000 PEC roots).

[11] Hesychius of Alexandria [Ed.].

1.6. **PIE *peḱu-* 'livestock':** OInd *paçu*, Avest. *pasu-*, Lat *pecu*, OHG. *fihu*, OEng. *feoh*, Lith. *pekus*, see *WP*, II, 16; **PNC *p̄äHäƛ̣wV* 'livestock (basically small horned animals [sheep and goats])':** Arch. *balƛ̣* 'ram', PTs. **biƛ̣* > Tsez. *beƛ̣* 'sheep (collective)', Hunz., Bezht. *biƛ̣*. 'sheep (sing.)', Av. *buruṭ* < **buṭ-ur* < **buƛ̣-ur* 'kid', And. *beƛ̣iri* 'deer' [sing.], PN **bĥoḳ* 'he-goat' > Chec., Ing. Chech. *bož*, Btsb. *bʕoḳ*; PAK **bŁa* 'flock' in the compound **χʷə-bŁa* 'flock of sheep' [where *χʷə* is 'sheep'], Ad. *χʷə-bɣa*, Kab. *χʷə-bža*.

Despite *WP*: II, 16 PIE **peḱu-* is hardly related to **peḱ-* 'comb, card'. Also doubtful as well is a Nostratic origin of the Indo-European root (see *MCCNJa*. 365) – for a root with a meaning such as this it is better to suppose a migrational character.

1.7. **PIE *porḱo-* 'pig, swine, suckling-pig (domestic)':** Lat. *porcus*, MIran. *orc*, OLG. *far(a)h*, Lith. *par̃šas* 'hog', Slav. **porsę* 'suckling-pig' (*WP*: II, 78); **PNC *wāIrƛ̣ƛ̣wə* 'pig, swine, sow':** PL **waIƛ̣ʷ* > Arch. *boIƛ̣*, Lezg. *wak*, Ag. *wak̄*, Ud. *boIq* and so on 'pig, swine'; Lak *burḳ*; PTs **buIƛV* > Tsez. *beƛo*, Gin. *boƛi*, Hunz. *buƛu* and so on; Btsb. *buruḳ* 'suckling-pig'; PAK **Ĺawə* (by metathesis < **waLə*) > Ad. *Ĺawə*, Kab. *Ĺaw* 'pig, swine, sow'.

An East Caucasian source is supposed by G. A. Klimov (Klimov 1971, 224-225) for Geor. *bur(w)aḳ-* 'adolescent suckling-pig'; that area is also under consideration regarding the question of the correlation between the Nakh-Dagestanian forms and PIE **porḱo-*.

1.8. PIE *ster-* 'barren, sterile (of animals), infertile': OInd. *starī́-* 'infertile cow; heifer'; Arm. *sterj*, *sterd* 'infertile (of animals)'; Gk. στεῖρα 'the infertile one (fem.)'; Alb. *štjerë* 'young cow; lamb'; Lat. *sterilis* 'infertile'; Goth. *staírō* 'the infertile one, the barren one (f.)', MHGerm. *sterke* 'cow that has not calved, heifer', see *WP*: II, 640; **PEC *ʔIīć̣wɨlV* 'heifer':** Av. *ʕač̣ar*, PA **č̣ora* > And. *č̣ora*, Tind, Kar. and others *č̣ara* 'heifer, one that is weak, not a sure bet'; PN **ʕāsse* 'calf (up to one year)' > Chech. *ēsa*, Ing *ʕasa;* PL (with metathesis) **luč̣a* 'heifer' > Tab. *lič̣*, Ag. *luč̣*, Tsah. *vuč̣e* and others; Darg., Chir. *luč̣*, probably < Ag.

The origin of PIE **ster-* 'infertile one (f.), heifer' from **ster-* 'hard; rigid, stiff' (*WP*: II, 640) is an obvious example of folk etymology.

1.9. **PIE *gʷēb(h)-* / *gʷob(h)-* (with irregular ablaut relations) 'toad, frog':** Slav. **žaba*, OPrus. *gabawo* 'toad', Lat. (< Osc.-Umbr.) *būfō* 'frog', MHGerman *quappe* 'burbot, eel-pout' etc. (*WP*: I, 674; Vasmer: I, 31, Walde, 74): **PEC *GG(w)V̄IṗV* 'frog, a kind of worm':** PL **qoIp̄* 'frog' > Lezg. *qib*, Tab. *ʁIub*, Rut. *ʁIib*, Kryz. *qub* and others; PN **qōṗV* 'trichina, trichinosis' > Chech. *qöba*, Ing. *qop*; Av. *q̇ob* 'malaria'.

Completely unclear is the relation to the Indo-European root of the Kartvelian forms (Laz *mǯvabu* 'toad', Megr. *žvabu* 'frog' [Čikobava 1938, 118; Klimov 1981, 169]): direct borrowing from Slavic languages is improbable, whereas if it is a case of it being of greater antiquity the initial consonant in Kartvelian is incomprehensible.

1.10. **PIE **pisk/peisk-* 'fish':** Lat. *piscis,* Goth. *fisks,* OIr. *iasc,* ? Slav. **pisk*-orjь (*WP*: II, 11); otherwise on the Slavic form see Vasmer: III, 267; **PNC **p̄Vš́wV* 'fish':** PTs. **bɨš̄^{w}V* > Tsez *besuro, bes^{w}iro,* Hin. *besuro,* Hunz. *bɨsə,* Bezht. *bisa*; PWC **p̄əšV* 'fish' > Ub. *psa*; PAK **p̄c̄a* > Ad. *pca,* Kab. *bʒa* 'large fish'; PAT **pəśə* > Abkh., Bz. *a-psə́-ʒ,* Abaz. *ps-lač^{w}a* 'fish'.

If we accept the comparison, the *–k-* element in Indo-European should be deemed an old suffix (diminutive?). For a comparison of the West Caucasian material (not including the Tsez forms) with Indo-European see Dumézil 1963, 18.

1.11. **PIE **k̂ek̂-/*kek̂-* 'weasel, polecat':** OInd. *kaça-, kaçīkā́* 'weasel', Lith. *šẽškas,* Latv. *sesks* 'polecat' (*WP*: I, 381; Fraenkel, 976-977); an irregular variant **ĝeĝh-* is reflected in OInd. *jáhakā* 'polecat' (or 'hedgehog' [Mayrhofer, 426; *WP*: I, 570]); **PNC **c̣V̆rʒV* 'marten, weasel, squirrel':** PL **c̣orc̣-ol* 'marten' > Tab. *čurc̣ul, c̣urc̣ul,* Ag. *c̣urc̣ul,* Lezg. *cuc̣ul*; Av. dial. *zazi-ʕunḳ̱* 'squirrel' (*ʕunḳ̱* 'mouse'), PN **c̣eca-* > Chech. *c̣eca-joqqurg* 'weasel', Ing. *cic-χolg* 'rat'; PWC **c̄VʒV* 'marten, weasel (with various assimilations in the reflexes) assimilations in the reflexes) > Ub. *čaca* 'beaver', PAK **c̄əʒá* 'marten' > Ad. *cəza,* Kab. *ʒəʒa*; PAT **ćəʒV* > Abaz. *ʒəʒəc* 'weasel', Abkh. **a-pš́-ćʒa,* Bukv. 'red marten' > *a-pšʒa* 'weasel').

Borrowing from a Turkic source for the Adygh form is ruled out (despite A. K. Shagirov [Šagirov 1977: I, 168]).

2. NAMES OF BODY PARTS

2.1. **PIE **(H)ang-* 'hip, ankle':** OInd. *aṅga-*'member, part of the body'; OHG. *ancha, enka* 'hip, 'tubular bone', OIc. *ekkja* 'ankle, heel' (Germ. **ankjōn-*), cf. also Germ. **ankulan-* 'ankle' > OHG. *enchila,* OIc. *ǫkkla* and so on (*WP*: I, 6); **PEC **hlānqqV* 'hip, part of the leg':** PL **ʔaq* > Arch. *aq* 'leg; rear leg of an animal'; Tab. Dyub. *aqa* 'hip [of a man, animal], rear leg [of an animal]', Ag. *aʁ* 'hip; calf (of the leg)'; PA **ʔanqu* > And. *aqu* 'hip', Tind. *anqu* 'knee bone'; Chech. *ħōq-am* 'calyx (anatom.)'. *WP*: I, 61 relates to this (with a question-mark) PIE **ang-(lo-)* 'corner' (Arm. *ankiun,* Lat. *angulus,* Slav. *ǫglъ*) and considers the root **ang-* a variant of PIE **ank-* 'to bend', which is doubtful (especially in view of the Caucasian parallels).

2.2. **PIE **(l)i̯ĕk^{w}-* 'liver':** OInd. *yákr̥t,* Gk. ἧπαρ̥, Lat. *iecur;* Lith. *jẽknos, jãknos,* Latv. *akne;* the Arm. form *leard* and Germ. form **lifar-* may point to the **l-*, and cf. as well OPrus. *lagno,* although this may just be a slip of the pen in place of *jagno* (Toporov 1980, 11; *WP*: I, 105; Benveniste 1935); **PEC **lăHăƛ̣wV* 'liver':** PL **läƛ̣* > Tab. *liḳ,* Lezg. *leq̇,* Bud. *leq̇* and others; PA **riƛ̣a-jiƛ̱* > Akhv. *riƛ̣ajƛ̱i,* Tind. *relaƛ̱,* And. *reƛ̣iƛ̱i* and others; PN

**dVHVχḳ* > Ing. *dijχk,* Chech. *doˁaχ̣;* with metathesis Av. *ṭul* (< **ƛ̣ul*); cf. as well as Ur. *zeldə* (< **ƛ̣-*) 'liver'.

V. M. Illich-Svitych [*OSNJa*: II, 17] separates the Armenian and Germanic forms from the remaining Indo-European forms, deriving them as being supposedly from Nostratic **l/e/ṗA* 'spleen'; in view of the PEC form, however, deriving all the Indo-European forms from PIE **li̯ekʷ-r̥-*, as proposed by Benveniste (Benveniste 1935: 182), appears more satisfactory.

2.3. **PIE **Hu̯ələnā* 'hair, wool, fur':** OInd. *ū́rṇā;* Gk. λῆνος; Lat. *lāna;* Goth. *wulla,* OHG. *wolla* and so on; Lith. *vìlna,* Latv. *vil̃na;* OSl *vlъna;* Welsh *gwlan,* MIr. *olann* and others; Hitt. *ḫulana-;* see *WP*: I, 296); **PEC **ƛ̱wāhnɨ* 'hair, wool':** PN **kān* spring hair, wool, fur' > Ing. *ka,* Chech. *kan;* Av. *ƛ̱uh* in *ƛ̱uh baqize* 'flay, skin'; Kar. *λũji,* Tok. *λuni* 'hair [strand]'; PTs. **λ̱ũ* 'hair, wool, fur' > Gin. *λu-s,* Hunz. *λũ,* Bezht. *λu* and others; Khin. *ka* 'hair, wool, fur'; PL **λ̱aj* 'wool' (of sheep)' (Arch. *oλ,* Tab. *xa,* Khyur. *x̱aj,* Ag. *xej,* Burshch. *š:i,* Tsakh. *xa,* Ud. *xa*).

The segmental structure of the PIE and the PEC forms is identical (on the PIE **l* = PEC **ƛ̱* correspondence see below) with the exception of the position of the laryngeal (in PIE in the initial, in PEC in the medial)[12].

2.4. **PIE **kais-* 'hairs':** OInd. *kesara-* 'hairs, mane', Lat. *caesariēs* hairs of the head'; (Mayrhofer: 268; Walde: 81); cf. also, perhaps, Hitt. *kišri-* 'something which is hairy, wooly, furry; hair, wool, fur?' (*WP*: I, 329; Kronasser 1956: 64); the words: OSl. *kosa, kosmъ,* Lith. *kasà* 'plait, tress, braid', OIc. *haddr* (**hazda-*) 'feminine hairs' may represent contamination of the root **kais-* and the root **kes-* 'to comb', from which the words usually are derived, see *WP*: I, 449; **PEC **kwVsV* 'braid, hairs':** Tab. *kuš* 'braid'; Av. *kʷas* 'hair, wool, fur'; Tsez. *kos* 'cock's comb'; PWC **kʷəs(w)V/*sVkʷə* 'mane, crown' > Abkh. *á-kʷsə* 'crown', PAK **sákʷ* > Ad. *sakʷ,* Kab. *sokʷ* 'mane').

In connection with the Indo-European words with suffixal *-r-* a series of East Caucasian derivatives with the suffix **-lV* can be noted (on the correspondence PNC **l* = PIE **r* see below), cf. Darg. Sirg. *kusala* 'wing', Btsb. *karsā* (**kas-Vl-*) 'wattled rope of goat's hair' and others.

2.5. **PIE **kenk-* 'a part of the leg':** Lith *kenklẽ* 'hollow, depression under the knee'; Germ. **hanha-* 'heel; knee tendon' (*WP*: I, 401, Fraenkel, 239); **PNC **q̇ămq̇ə* 'a part of the foot':** PL **q̇amq̇(a)* 'knee' > Tab. *q̇amq̇,* Ar. *q̇ʷaqʷ,* Rut. *q̇ʷaq̇;* Darg. Ak. *q̇uq̇a,* Kad.

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[12] If in Hattic a metathesis of the laryngeal (*ḫulana-* < **hulᴀna-*) is presupposed, as is usually done in order to explain the Indo-European long sonant in a given root (**u̯ələnā-* < **u̯l̥̄nā* < **u̯l̥Hnā*), then the coincidence of the PIE and PEC forms will be still more exact.

q̇unq̇a 'knee'; Tsez. *q̇alq̇u* 'tubular bone'; PAT **q̇ʷaq̇ʷa* 'pelvic bones' > Abkh. *a-q̇ʷaq̇ʷa*, Abaz. *q̇ʷaq̇ʷa*.

2.6. **PIE **konə-mo-* 'tibial bone, shin':** Gk. κνήμη 'tibial bone, shin'; OIr. *cnāim* 'bone, leg'; OHG. *hamma* (< **han-ma-*) 'hip; knee hollow, cavity', (*WP*: I, 460; Frisk, 883); **PNC **ḳwVnV* 'bone of the leg':** PA **ḳʷinij* > Lezg. *ḳunuḳ* 'ankle', Rut. *ḳuni*, Tsakh. *ḳunu* 'knucklebone', Kryz. *ḳʷani* 'hip'; PAK **ḳánə* > Ad., Kab. *č̣́an* 'knucklebone'.

2.7. **PIE **gʷet-* 'intestine, gut'**: Lat. *botulus* 'intestine'; Goth. *qiþus* 'stomach, belly, maw, womb', OEng. *cwið* and others (*WP*: I, 671; Walde, 70); **PEC **qqwata* (~-ĕ-) 'intestine, stomach':** Lak *qata* 'large intestine' (of small horned livestock)', Av. *qʷatá* 'large intestine'; Kar. *qʷata* 'stomach'.

2.8. **PIE **ĝ(h)enu-*:** OInd. *hanu*; Lat. *gena* 'cheek' *dentes genuīnī* 'back teeth'; OIr. *gin, giun* 'mouth', Welsh *gen* 'cheek, chin'; Goth. *kinnus* 'cheek', OHG. *kinni* 'chin' and others (*WP*: I, 587); **PEC **č̣(č̣)anV* 'cheek':** PTs (with reduplication) **č̣eč̣enV/č̣ič̣inV* 'chin' > Tsez. *č̣ič̣in*, Inkh. *č̣eč̣en*, Bezht. *c̣ic̣ina* and others; PN **č̣ăn-iḳ* (*-iḳ-*: a diminutive suffix) 'chin'> Ing. *č̣ang*, Chech. *č̣enig* Btsb. *č̣aniḳ*.

2.9. **PIE **tu̯ak-* 'skin':** OInd. *tvac-* 'skin, hide'; Gk. σάκος 'shield of skin, leather' (*WP*: I, 747; Frisk: II, 672; Mayrhofer, 537); related here as well, apparently, is Hitt. *tuekka-* 'body'; **PEC **c̣c̣əkwV* (~-ʒʒ-) 'hide':** Av. *c̱okó*, PA **c̱ikwV* > Akhv. *c̱oko* 'skin', Tind. *c̄oka* 'goat-hide', And. *c̱uku* 'id.'; PN **c̣ōka* > Ing. *c̣oka* 'hide (wolf's, dog's)', Chech. *c̣ōka* 'hide'.

2.10. **PIE **pērs-nā* 'a part of the leg':** OInd. *pārṣṇi-*, Avest. *pāšna-* 'heel'; Gk. πτέρνη 'heel; ham, gammon'; Lat. *perna* 'back part of the hip; ham, gammon'; Goth. *fairzna*, OHG. *farsana* 'heel'; see *WP*: II, 50; related here also is Hitt. *paršna-* 'lower part of the leg' (Friedrich: II, 163); **PEC **pwərccV* 'paw; ham, gammon':** PL**p̄ac* 'paw' > Lezg. *p̄ac*, Tab. *bac* and others; Av. *purči* 'ham, gammon (of animals)'; Cham. *becw* 'knee'; here as well probably belongs PTs **bɨsV* 'fist' > Tsez. *besi*, Hunz. *bɨza* and others.

A Nostratic etymology for the PIE form [*MSSNJa*, 342] appears unhopeful (the author himself introduces it with a question mark), and in light of the Caucasian data it seems advisable to reject it.

2.11. **PIE **penkʷe* 'five':** OInd. *pañca*; Arm. *hing*; Gk. πέντε; Tokh. B *piś*; Alb. *pesë*; Lat. *quinque*; OIr. *cōic*; Goth. *fimf*; Lith. *penkì*; Slav.**pętь* (*WP*: II, 55); **PEC **χwinḳwV* 'fist':** Arch. *χ̱iḳ*; Darg. **χ̱unḳ* > Ak. *χunḳ*, Kharb. *χ̱unḳ* and others; PA **hunḳA*[13] > God. *hunḳa*, Cham. *hũč̣a*, Bagv. *hunḳa*.

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[13] The symbol A in Proto-Andi reconstructions signifies an alternative possibility of the reconstruction of PA **a* or **o* (these vowels differ from each other only in the Andi language, whereas in the remaining languages they fall together into a common *a*; the vowel *o* in the remaining Andi languages has a secondary origin, the result of a transfer of labialization from the neighboring consonant).

For PIE an alternative reconstruction _*kʷenkʷe_ is not excluded (if the Italo-Celtic form is assumed to be archaic and if an early dissimilation _kʷenkʷe_ > _*penkʷe_ in the other PIE dialects is assumed; on the analogic reconstruction of _*kʷerkʷo-_ 'oak' see below). The original meaning 'five fingers, fist' can be traced in its derivatives (cf. Germ. _*fing(w)raz_ 'finger' < _*penkʷ-ró-s,_ as well as PIE _*pn̥kʷ-sti-_ 'fist' > OHG. _fūst_, OEng. _fȳst_, OSl. _pęstь_, Lith. _kùmstė_ [_WP_: II, 84; Fraenkel, 309-310]). Acceptance of the reconstruction _*kʷenkʷe_ and an initial meaning of 'five fingers, fist' renders the Indo-European-Caucasian parallel quite hopeful (Vyach. Vs. Ivanov pointed out the possibility of this comparison).

2.12. **PIE _*bhāĝhu-_ 'a part of the arm':** OInd. _bāhú-_ 'arm, armpit; foreleg (of an animal)', Avest. _bāzu-_ 'hand, arm'; Gk. πῆχυς 'elbow, armpit'; OIc. _bōgr_ 'arm, shoulder'; Toch. A _pokeṃ_ 'arm' (_WP_: II, 130); **PNC _*p̄üggV_ 'side, part of the body from the armpit to the hip':** PL _*p̄eƛ̱_ 'side' > Rut., Kryz. _beg_ 'side', Rut. _beɣ-da_ 'near' (< 'at the side') and others; Khin. _buɣru-_ 'side'; Bezht. _beƛ̱ejo_ 'part of the body from the armpit to the hip'; PAA _*bəɣV_ 'waist, loins' > Abkh. _a-bʁa_, Abaz. _bʁa,_ Ad., Kab. _bɣə._

2.13. **PIE _*saim-_ 'thick liquid':** Gk. αἷμα 'blood', OHG. _seim_ 'treacle'; see Frisk: I, 39; the remaining Indo-European parallels, collected in _WP_: II, 465 under the root _*sē(i)-_ 'to drip, dribble, drop; humid', are entirely unreliable; **PNC _*c̄wä̆jmi_ 'bile, gall':** PL _*šäm_ > Arch. _šam_ 'bile; anger, ire'; Tab. _seb_ 'bile'; Lezg. _seb_ 'anger, ire'; Darg. _*θumi_ > Ak. _himi,_ Kub. _tume,_ Tsud. _simi_ 'bile; anger, ire'; Lak _ši_ 'bile; anger, ire'; PA _*šimi_ 'bile' > Akhv., Tind. _šimi_, And. _šim_ and others; Av. _čin_ 'bile; anger, ire'; PTs _*šɨmə_ 'bile'> Tsez. _semi,_ Georg. _simi_ and others, PN _*stim_ 'bile' > Chech. _stim_, Ing. _sim_, Btsb. _sem_. In PWC the reflex of this root _*ž́ʷə_ appears only in the formation _*ǵʷə-ž́ʷə_ 'anger, ire, spite' (where _*ǵʷə_ is 'heart'); cf. Abaz. _gʷəžʷ_ secret, repressed spite', Ub. _ǵəžʷ_ 'spite, vengeance', Ad. _(gʷəħa)-gʷəź,_ Kab. _gʷəź(-ʁaź)_ 'secret, repressed spite'.

2.14. **PIE _*stom-en-_ 'mouth':** Avest. _staman-_ dog mouth, Afg. _stūnay_ (< _*stamna-ka-_) 'larynx'; Gk. στόμα 'mouth', Welsh _safn_ 'mandible, jaw', OBret. _istomid_ 'palate' and others (_WP_: II, 648; Dybo 1974, 100); **PEC _*ʒ́wĕmV_ 'mouth, chin':** Ud. _źomo(χ)_ 'mouth, lips, mouth [of animals]; Lak _zuma_ 'mouth, lips; edge, end'; PA _*žʷina_ / _*žʷima_ 'chin' > Kar. _žomo,_ Btsb. _žuna,_ Akhv. _žonoƛ̱i_, Tind. _žinaƛu._

2.15. **PIE _*s/p/elĝn(en)-_ 'spleen':** OInd. _plīhán-,_ Avest. _spərəzan-_; Arm. _p`aicałn;_ Gk. σπλήν; Lat. _lien;_ OIr. _selg;_ OSl. _slězena;_ Lith. _blužnìs_ (_WP_: II, 680); **PNC _*ʒwile/r/ʒwV_ 'spleen':** PL _*c̄ʷilerc̄ʷ_ > Tab. _ǯᵛelerǯᵛ,_ Ag. _žʷelez,_ Lezg. _c̄ülez,_ Rut. _ziliz_ and others.; Darg. Chir. _zilaz_ 'spleen', Kharb. _ur-clerc_ 'kidney'; PWC _*ǯʷanVzʷV (~ źʷ)_ 'spleen; abomasum, rennet bag' > Ad. _ǯ́anaź_ 'abomasum, rennet bag', PAT _*ǯʷanəza (~ ź)_ 'spleen' > Abkh. _a-vanə́źa,_ Abaz. _ʒanəza;_ despite Shagirov 1977, 277, articulating or dividing the PAT form into _*ǯʷa_ and _-nəza_ is inadmissible.

As in the Indo-European, so also in the North Caucasian languages there are available several non-regular reconstructions of the root which do not, however, hinder a comparison of the PIE and PNC forms.

2.16. **PIE **kēr-* 'hair (single strand)':** Latv. *cera, cẽre* 'hairs on the head, shaggy hairs; Lat. [with irregular transformations] *cirrus* 'curly hairs'; OHG. *hār*, OEng. *hǣr* 'hair(s)'; see Vries, 210; *WP*: I, 413, 427, where the Germanic material belongs to another root); **PEC **kĭr(w)V* 'hair (single strand'):** Darg. Chir. *kur* 'horse's mane'; PTs. **kera* 'hair (single strand)' > Hunz. *kera*, Bezht. *keja*, Tl. *kera* and others; Av. *kar* 'hair (single strand)'; PA **kArV* 'hair (single strand)': Akhv. *kari*, Tind. *ḱara* and others; Chech. *kur* 'tuft, crest, forelock' .

2.17. **PIE **orso-* 'back, hindquarter, buttocks':** Gk. ὄρρος; OHG. *ars*, OEng. *ears* and others; Ir. *err* 'tail'; Arm. *oṙ*; Hitt. *arra-š* (*WP*: I, 138; Friedrich: I, 28); **PEC **ʔərəc̄wV* 'bottom, anus':** Av. *roč̄*, PA **riš̄*^{w}*i* > Avkh. *roš̄i*, And. *rus̄u*, Tind. *roš̄i* and others 'anus'; PTs.**rɔš̄* 'foundation' (< 'bottom'); PL **ʔaš̄-* 'bottom' (Tab. *as-iq*, *as-ik̄* 'below', *as-ina* 'down, downward', Ag. *ajs* 'bottom', Lezg. *as-ḳan* 'lower (adj.)' and others; cf. as well Hurr. *tawš̄* (< **rawš̄-*) 'bottom, ground'.

3. NAMES OF PLANTS

3.1. **PIE **(H)au̯iĝ-* 'oats':** Lith. *avižà*, Latv. *àuzas*, OPrus. *wyse* 'oats'; Slav. **ovьsъ*; Lat. *avēna* 'fodder oats' (*WP*: I, 24); **PEC **HVbVgV/*HVgVbV* 'a kind of cereal':** Av. *ogób*, gen. *abg-il* 'rye'; PA **hAgib* 'rye' > Akhv. *hagib*, Tind. *hagib*; PWC **bag(')ə-na* 'oats' > Shaps. *baǵən(a)*, Ub. *baǵəna*.

The above West Caucasian forms, despite Shagirov (Šagirov 1977: I, 72), are to be distanced from PAK **bagəna* 'a dish made from flour and sour cream' < Osset. *bägäny* 'beer' (Abaev 1958, 245).

3.2. **PIE **(H)āg-* 'berry, fruit':** Lith. *úoga* 'berry', Latv. *uôga* 'berry, sweet cherries'; Slav. **aga, *ag-oda* 'berry'; Tokh. B *oko* 'fruit'; Germ. **ak-ran-* 'fruit'; Ir. *āirnē* (< **agrīni̯a*) 'sloe, blackthorn' and others (*WP*: I, 173; Vasmer: IV, 545); **PEC **ʔĕqV* 'vinyard, fruit (juicy, edible)':** Darg. Chir. *aq* 'fruits (juicy, edible) '; PKh X **ʔoχ* 'vinyard' > Inkh. *oh*, Khwar. *oh*; PA **ʔoqi* > Akhv. *aqi*, Tind. *aχi* 'vinyard', Andr. *oχi* 'sweet cherries'.

3.3. **PIE **k̂ēko-* 'fodder grass':** OInd. *çāka-* 'edible grass, vegetables'; Lith. *šiékas* 'freshly mowed grass, green feed, forage'; OIc. *hā* (**hēhōn-*) 'aftermath', Swed. dial. *hå, håv* (*WP*: I, 381; Vries: 199, Fraenkel: 970-971); **PNC **c̣wēKV* 'chaff':** Lezg. *c̣eḳ*^{w} 'chaff'; Darg. Ak., Tsud. *c̣uk* 'straw'; PWC **ć̣*^{w}*VḳV* > PAK **č̣aḳá* > Ad. *ṣ́āč̣a* 'weed', Kab. *ṣ́āč̣a* 'chaff'; Abaz. *c̣aX̣a* 'grain, seed leavings (for bird feed); ? Ub. *ć̣əḳ́* 'fruit stone'.

3.4. **PIE **kermus-* (/ **k̂ermus-*) 'name of a plant':** Slav. **čermъxa, *čermuxa* 'bird-cherry'; Latv. *cermauksis*, Lith. *šermùšklė* 'ashberry, rowan'. It is not clear how the common Indo-European name for wild onion or garlic relates to this Balto-Slavic formation: Gk.κϱέμυον, κϱόμυον 'a kind of onion', Mid-Ir. *crim* 'garlic', OEng. *hramsan* 'forest garlic', Slav. **čermъša* 'wild-growing onion', Lith. *kermùšė* 'wild garlic'; see Berneker 1908, 145; Vasmer: IV, 339; *WP*: I, 426; **PNK **kkă̌rmuśV / *kkă̌rmuźV / *kkumă̌rśV* 'quince or some similar fruit-bearing plant':** PL **kurmäš/*kumärš* 'quince' > Tab. *kumiš*, Ag. Burshch. *kuršem;* a variant, **kurʒäm,* is reflected in Tab. Djub. *kuč̄im*, Ag. *kuržam;* Darg. **k̄imirθi* 'quince' > Ak. *gimirhi*, Kait. *č̄imisi* and others; Lak *k̄urmuz* 'mirabel (fruit'); the Lak form, probably, served as the source of Av. *germez,* Arch. *gerbec*); PTsKh **kušu-Hi* 'peach' > Tsez. *kušuħi*, Hin. *kušoħi;* PN **kămVs/-z* 'vinyard > Chech. *kems*, Ing. *koms*, Btsb. *kaniz;* PWC > Abkh. (with metathesis) *mərg^{w}əź-*, Bz. *a-mərg^{w}ə́ź-pħ^{w}a* 'a kind of plum' (*pħ^{w}a* 'plum'), *a-mərg^{w}ə́ź-ṭama* 'a kind of peach' (*ṭama* 'peach').

The word does not yield to further etymologization either in North Caucasian or in Indo-European (a comparison of the PIE form with Kartvelian **q̇ar-* 'to give off a stench' and Semitic-Hamitic **ḳr-* 'to smell' proposed by V. M. Illich-Svytich [*MSSNJa*: 354] must be rejected in that it is based on an arbitrary segmentation of the PIE base). We note the presence of that very root in Georg. *ḳomši* 'quince' (apparently from a North Caucasian source) from where, in its turn, Osset. *ḳomsi* 'quince' derives (Abaev 1958, 636). It is quite probable that Gk. κέϱασος (< **kerm̥so-*) 'cherry' has a North Caucasian (Hurrian?) source from which in the final analysis the European names for cherries and bird-cherries come (Frisk, 828; Vasmer: IV, 343, with references).

3.5. **PIE **gholg(h)-* (~*-a-*) 'branch, stick':** Arm. *jałk* 'branch, twig'; Goth. *galga* 'stake, cross; OIc. *galgi* 'gallows, *gelgia* 'branch, stick' and other Germ. words ; Lith. *žalgà, žalgas* 'long, thin põle; (*WP*: I, 540); **PEC **k̄alVk̄V* (~*k̄k̄*) 'branch, stick':** Darg. **k̄alk̄a* > Ak. *galga,* Kajt. *k̄alk̄a* 'tree', Chir. *k̄alč̄e* 'branch'; Av. *gerégi* 'block (executioner's)' (from Av., borrowed by Arch. *geregi* 'stump of a cut tree without branches'); Bezht. *gaga-ṭo* 'rolling-pin'.

As in PIE, so also in PEC as well there are non-reduplicated forms: for PIE cf. OInd. *halá-* 'plow', Arm. *joł* 'stake, long branch'; Lith. *žuolis* 'piece of wood' (**ghōl-*; for PEC cf. Tsez. *gilu* 'pole', Lak *č̄ala* 'bayonet', PN **găl(a)* > Chech. *gala* 'a kind of skitties (sport), chock (sport)', Btsb. *gal* 'birch (tree)' (**k̄ălV~*k̄k̄ălV*).

3.6. **PIE **ĝherd-* 'pear':** Gk.ἄχεϱδος, ἀχϱάς 'pear (wild)'; Alb. *darδë* 'pear' (Frisk: I, 199); **PNC **qū̃Ire* 'pear':** PL **χeIra* > Arch. *χIer-t*, Rut. *χIɨr*, Ud. *ar* and others; Darg. Ak., Chir. and others *qaIr;* Lak *quIr-t* 'pear'; PN **qōr* 'pear, apple' > Chech., Ing. *qor* 'pear', Btsb. **q^{w}ə(źə́)* > Ad. *qwəźə,* Kab. *qwəź*.

The Archi and Lak forms have the suffix *-t;* (in final position < **-d*), characteristic also for a number of names of leaf-bearing trees (cf. PEC **qĕrdi* 'linden', **c̣̆c̣̆weIldi* 'willow' and others). Interesting in this connection is the presence of *-d-* in the Indo-European form. The comparison appears to be trustworthy despite the small distribution of the base in the Indo-European area.

3.7. **PIE **glŏ̆gh-* 'prickle, spike; thorn':** Gk.γλῶχες 'awn, beard of a wheel', γλωχίς 'sharp (adj. pl.)'; Slav. **glogъ* 'hawthorn; blackthorn'; see *WP*: I, 662; Vasmer: I, 414; **PEC **qqĕlĕqqe (-i)* 'bush (prickly), thorn':** Lak *x̱alax̱i* 'thorn, needle'; Av. *qaraq* 'prickly bushes (collect.)'; Akhv. *qolaqe* 'bush'; to this, probably, should be connected 'tree' (with a change of meaning of 'bush' > 'tree') PHB **χõχe* 'tree' > Hunz. *χõχe*, Bezht. **χoχo* and, apparently, Chech. *ʁarʁa* 'a kind of poplar'.

3.8. **PIE **perk^{w}o-* 'oak':** OInd. *parkatī* 'ficus religiosa', Punj. *pargāi* 'quercus ilex'; Afg. *pərgáy* (< **parku-ká-*) 'acorn'; Lat. *quercus* 'oak'; OHG. *fereh-eih* 'oak', *forha* 'pine' and others; see Dybo 1974, 95; Mayrhofer, 221-222; **PEC **χwīrk(w)V* 'a kind of tree (oak?)':** Av. *hirk* 'acorn'; PL **χ̱^{w}ɨ(r)k* > Arch.*χ̱^{w}ak* 'forest', Rut. *χuk* 'tree'.

If for PIE the original form is **k^{w}erk^{w}o-* (cf. Lat. *quercus*), then the comparison is acceptable (cf. above on PIE **k^{w}enk^{w}e* > **penk^{w}e* 'five').

3.9. **PIE **pel(u̯)-* 'name of a leaf-bearing tree':** OHG. *fël(a)wa* 'willow'; Osset. *farwe, färwe* 'alder'; Lat. *pōpulus* (< **plōpol-os*) 'poplar'; ? Slav. **topolь* (by dissimilation < **popolь*[14]); Gk. πτελέα, πελέα 'elm'; therefore despite *WP*: II, 55, 85; Vasmer: IV, 79; **PNC **pwīIlV* 'a kind of leaf-bearing tree':** Darg.**paIl* > Tsud. *paIl* 'poplar', Ak. *paIlpaIl-ag* 'aspen'; PTsKh **biIle*, Tsez. *beIli* 'poplar, ash', Gin. *bele* 'poplar', Inkh. *buIle* 'aspen'; Chech. *bȫl-ak* 'grove'; PAA **ṕ^{w}V* > Abkh. *a-t^{w}a* 'lime-tree, linden' Ub. *pa-sə, t^{w}a-sə* 'beech' (-*s* 'tree').

The reduplication in Darg. *paIlpaIlag* is similar to the reduplication in Lat. *pōpulus* and Slav. **topolь* < **popolь*. In view of the clear connection of the PIE and PNC forms the relationship to this of the Proto-Altaic forms **pula* 'poplar, aspen' is not wholly clear (on the rapproachement of the Indo-European and Altaic roots and the reconstruction of Nostratic **ṗulV* 'poplar' see *MSSNYa*: 369).

3.10. **PIE **pĭ̄tu-* 'pine, fir, spruce':** OInd. *pītu-dāru* 'a kind of fir'; OGk. πίτυς 'pine, fir'; taking the original meaning to be 'resin' (see below) it is tempting to get from this OInd. *pitu-*, Avest. *pitu-* 'juice, sap, drink (n.)'; Lat. *pītuīta* 'mucus, slime, humidity', although these words may well have a different origin (_WP_: II, 74-75); **PEC _*pinçç̣wV_ 'resin, juice, sap'**: Darg. Ak. _penç_ 'resin'; Lak _piç_ 'melliferous dew; perspiration'; Av. _piç̱_ 'resin' (> Arch. _piç_); PA _*pinči/*binç̱i_ 'resin' > And. _pirç̱i_, Akhv. _miç̱i_, Tind. _mič̄i_, Kar. _biç̱i_; Chech. _mutta_ 'juice, sap'.

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[14] The Slavic forms, as V. A. Dybo believes, appear to be a borrowing from Romance: cf. Ital. *tolpono*, Rheto-Rom. *talpon* and others, reflexes of the form **toplōn-* — probably derived from an unattested **tŏpŭlus*. It is not clear how OInd. *píppala-* 'Ficus religiosa' relates to that root.

As with the preceding root, in this case also a Nostratic parallel comes to light (on Nostr. _*peč̣V_, reflected in Ural. _*pe(n)ča_ 'pine' and Turk. _*bāš/*böš_ 'pine', see Terent'ev 1979, 160-162; Georg. _pič̣vi/bič̣vi_, mentioned in the same source, most likely has a North Caucasian source). It must be emphasized, however, that the Indo-European root (as V. A. Terent'ev notes), can not be a regular reflex of Nostr. _*peč̣V_.

3.11. **PIE _*peuk̂-_ 'fir, spruce'**: Gk. πέυκη; OPrus. _peuse_; Lith. _pušis_; OHG. _fiuhta_; MIr. _ochtach_ (_WP_: II, 15; Frisk: II, 523; Fraenkel, 679); **PEC _*bilnḳḳwV_ 'fir, spruce, pine'**: Tab. _muḳ-ruḳ_ 'fir'; Lak Arak. (with reduplication) _milḳiḳij_ 'pine cone'; PN _*baḳa_ > Chech. _baga_ 'pine', Ing. _baga_ 'resinous root of the pine'; for the secondary development of _*bilnḳḳwV_ > _*milnḳḳwV_ > _*nilḳḳwV_, cf. further Av. _naḳ̱_ 'pine', PTs _*neqi_ 'pine' > Hunz. _niqe-s_, Bezht. _niqe_, Tsez. _niqe-s_.

A Nostratic etymology of the Indo-European form (Terent'ev 1979, 162) appears doubtful, first of all on phonetic grounds (Ural. _-k-_ can not correspond to PIE _-k-_), although possibly the similarity of the forms cited above to Ural. _*pükä_ 'cone' and Tung. _*bokoto_ 'cone' are not due to chance.

3.12. **PIE _*bherəĝo-/-ā-_' birch'**: OInd. _bhūrja-_ 'a kind of birch'; Osset. _bärz_; Lat. _farnus, fraxinus_ 'ash'; OHG. _birihha_, OEng. _beorc_ 'birch' and other Germ. examples; Lith. _béržas_; Slav._*berza_; Alb. _bredh_ 'fir, spruce'; see (_WP_: II, 170); **PEC _*wēlrqwɨ_ 'birch'**: PL _*werχl_^{w} 'birch' > Lezg. _werχ_, Rut. _wuχl, huχl_, Tsakh. _woχl_; PA _*birq_^{w}_V_ 'birch' > Akhv. _beqo-li ruša_ (_ruša_ 'tree'), Kar. _berχ-oƛ roša_ (_roša_ 'tree'), And. _beχu_ and others; cf. as well Av. _biháro, beháro_ 'poplar', Bezht. _biʁola_ 'asp', Lak _buq_ 'sloe'.

Identifying PIE _*bherəĝ-_ 'birch' as from _*bhrēĝ-_ 'shine, sparkle' (_WP_: II, 170) is, most probably, folk etymology. In the Dagestanian languages there are forms that can appear to be relics of an ancient "Indo-Iranianism", cf. Darg. Ak. _biriz_ 'poplar', Tab. _buruʒ_ 'post, pole, pillar'; and also possible is Chech. _bursa_ 'a kind of bushes' (PEC _*burVźV ~ *p̄-_); in such case it is necessary to consider PEC _*welrqwi_ and _*burVźV_ an etymological doublet.

3.13. **PIE _*bhā(u)ĝo-_ 'beech'**: Gk.φηγός 'oak'; Lat. _fāgus_ 'beech'; OHG. _buohha_, OEng. _bōc_ 'beech' and other Germ. words; Kurd. _būz_ 'a kind of elm'; here also belongs, apparently, Slav. _*buzъ, *bъzъ_ 'elder' (_WP_: II, 128-130); **PNC _*p̄ŏlnqqwe_ 'oak, wood'**: PWC _*pə̃q́_^{w}_a (~p̄-, -χ_^{w}_-)_ 'wood' > PAK _*pχa_ > Ad., Kab. _pχa_ 'wood'; Abkh. _mħa-_ (in the names of articles crafted of wood)—_a-mħá-ć_^{v} 'spoon', _a-mħa-bə́sta_, Bz. _a-mħá-p_ 'a round long-handled wooden scoop for hominy', *a-cᵛə́-mha*, Bz. *a-mħa-cᵛ* 'a round, long-handled wooden scoop for hominy' and others; Ub. *məχ́a-* (in analogical constructions)—*məχ́ā́-çʷ* 'spoon', *məχ́ā-ç̌́a* 'spade for stirring hominy, gruel'; PEC **mŏIqqwe* 'oak' > PL **maqIʷa* > Tab. *maqIʷ*, Lezg. *meʁʷ*, Rut. *maχIʷ*, Tsakh. *moqI*, Gel'm. *maqIʷa* and others; Darg.**mik̄ʷ* > Ak. *mig*, Kub. *mikʷ* and others; PTsKh **muqurḳa* 'acorn' > Khwarsh., Inkh. *muqurḳa*; Av. *mik̄* 'oak tree, acorn'; PA **mik̄ʷV* > Kar. *mik̄*, Tind. *mix̱i* and others.

3.14. **PIE **bhar(e)s-* 'barley':** Lat. *far*, Hen. *farris* 'grain in seed; meal, flour', *farīna* 'meal, flour'; Goth. *bariz-eins* 'barley (adj.)', OIc. *barr* 'barley' and others; Slav. **boršьno;* **PEC **bVrč̣-inV* 'a kind of cereal, barley':** Av. *purč̣ina* 'barley', PA **bič̣in* > Tind. *beč̣in*, God. *beč̣in* 'barley' and others; Chech. *bažan* 'rye'; Lak *bulč̣in* 'dry leaves (of leguminous plants)').

-inV* in East Caucasian forms becomes suffixal (as is apparent, for example, from Av. pl. *purč̣a-bi*); characteristic are the identical PEC **bVrč̣-inV* = PIE **bhars-ĭ̄no-*. From the Indo-European forms examined above it follows that Slav.bъrъ* 'millet' is to be separated out (*ÈSSJa*: III, 134-135; Vasmer: I, 193); for this reason it is difficult to agree with V. M. Illich-Svitych (Illič-Svityč 1964, 4), following instead F. Hrozný (Hrozný 1913, 38), deriving the Indo-European root from Sem. **br(r)* 'seed, threshed seed'.

3.15. **PIE **ned-* 'cane, rush, reed, rush (with a spongy stem)':** OInd. *nada-*, Pers. *nai*, dial. *nad* 'cane (with spongy stem)'; Arm. *net* 'arrow'; Lith. *néndrė* 'rush (with spongy stem)' (*WP*: II, 329; Fraenkel, 493; Mayrhofer, 127); **PEC **nəHəçç̣wV* 'cane, rush, reed, rush (with spongy stem)':** PL **naç̣*, Lezg., Tab., Rut., Tsakh. *naç̣*, Ag. *neç̣*; Av. *nuç̣̱i/muç̣̱i* 'cane, rush, reed, rush (with spongy stem)'; with metathesis PA **ç̣̱imʔV* > And. *ç̣̱uma*, *ç̣̱ʷa*, Tind. *c̄ū*, Cham. *ç̣̱imi* and other Andi words.

3.16. **PIE **rughi̯o-* 'rye':** OIc. *rugr*, OEng. *ryge* and other Germanic words; Lith. *rugỹs*, Latv. *rudzis*; Slav. **rъžь* (*WP*: II, 374); **PEC **rəƛ̱ƛ̱V* 'oats, wheat':** PL with reduplication **ƛ̱arƛ̱ar* 'oats' > Lezg. *gerg*, Tab. *γarγar*, Ag. *jerg*, Rut. *γarγal*, Tsakh. *gargar*; Av. *roƛ̱* 'wheat'.

3.17. **PIE **lento-* 'tree name; wood':** OIc. *lind*, OHG. *linta* 'linden'; Slav. **lǫtъ* 'young linden, its bark'; Lith. *lentà* 'board, plank'; Alb. *landë*, *lëndë* 'timber forest'; ? Gk. ἐλάτη 'fir'; see *WP*: II, 437; Vries: 357; **PEC **ƛwinīV (~-ē-, -ɨ̄-)* 'firewood, wood':** PTS **ƛwɨ̄dV* > Inkh. *lɨdo*, Khwarsh. *lida*, Gin. *rede*, Hunz. *hūdu* and others; PA **ƛundV* > Akhv. *ƛuda*, And. *ƛudi*, Cham. *ƛunni* and others).

Relating the PIE root **lento-* to 'flexible, lithe; slow' has an obvious folk-etymological character.

3.18. **PIE **lĭ̄no-* 'flax':** Lat. *līnum*; Welsh. *llin* and others in Celt., Alb. *liri*, Geg *l'i̯ni*; Goth. *lein*, OHG. *līn* and others in Germ.; Gk. λίνον; Lith. *linaĩ*, OPrus. *linno*; Slav.

*lъnъ (_WP_: II, 440-441); **PEC _*λ̲winʔɨ_ 'seed (in part, flaxen)':** PL _*λ̲ʷin_ 'seed, grain') > Lezg. _fin_, Arch. _λ̲ʷin_ 'seed', Rut. _xin_ 'wheat', Kryz. _xin_ 'flax'; Darg._*xʷe_ 'seed' > Ak. _he_, Kub. _xʷe_, Urakh. _hʷi_ and so on; Lak _hanna_ /dial. _lanna_/ 'seeds'; Av. _xon_ 'flax; threshed flax seed'; PA _*xunʔi_ 'seed' > And. _šen_, Tind. _hũʔu_, Kar. _xũji_, Cham. _huni_ and others; PN _*fŭ(n)_ 'seed' > Btsb. _hu_, Chech. _hu_ (gen. _hüna-n_), Ing. _fu_ (gen. _funo_).

In PEC the base hopefully etymologizes as deriving from the verb_*ʔV-λ̲wVn-_'to sow' (cf. Cham. _hãhʷna_, Av. _xa-_, Darg. Chir. _-axʷn-_ 'to sow' and others).

3.19. **PIE _*sasi̯o-_ 'a kind of cereal':** OInd. _sasya-_ 'food grains, bread grains, cereals', Avest. _hahya-_ 'bread cereals'; Gall. _(s)asia-_ 'rye', Welsh. _haidd_, Bret. _heiz_ 'barley'; the root without suffixal _-i-_ is represented in OInd. _sasa-_ 'nourishment, nutrition; edible plant'; **PEC _*sūsV_ 'a kind of cereal':** Lak _sus_ 'rye'; Chech. _sos_ 'a special kind of rye'; with suffixal _–r_, cf. Darg. Kad. _sursur_ 'rye'; Av. _susur_ 'a weed similar to oats, a wild edible cereal', PA _*susur_ > Akhv. _šušul_ 'oats', And. _susur_ 'a weed similar to oats', Tind. _susur_ 'bran'.

The root under discussion must be distinguished from PEC _*šulV_ (and from reduplicated _*šulšulV_) 'rye, oats', which in several languages contaminates with reflexes of _*sūsV_. The root _*šulV_, apart from the Eastern Slavic languages (from where it probably penetrated into Ossetian both in a simple and in a reduplicated form, cf. Osset. _syl_ 'rye', _sysyly_ 'darnel, cockle') is widespread as well in Turkic, Finno-Ugrian and Kartvelian (Georg. _svili, svila_ 'rye')—see Abaev 1979, 194-195, 211. It is, however, absent in the Indo-European languages.

3.20. **PIE _*(H)aiĝ-_ 'oak':** OHG. _eih_, OEng. _āc_ 'oak tree' and other Germanic words; Gk. _αιγί-λωψ_ 'a kind of oak', _αἴγειρος_ 'Populus nigra'; ? Lat. _aesculus_ (_*aig-selo-_) 'mountain oak' (_WP_: I, 10; Walde, 12-13); not wholly clear is the relationship here of Baltic _*aižōl-/*anžōl-_ 'oak' (_WP_: I, 10; Toporov 1975, 93, with references); **PNC _*ʔăǯwV_ 'bush; tree':** PA _*ʔAžilV_ >Akhv. _ažali_ 'bush', Kar. _ežela_ 'pine'; PTsKh _*ʔažʷV_ > Tsez. _ažʷi_ 'tree, Hin. _aže_ 'tree, bush', Inkh. _ažan_ 'bush; PWC > Abkh. Bz. _a-ź_ 'bush'. Cf. also Hurrian _az̠u-γəl/az̠u-ḫḫə_ 'fir, spruce'. [15]

3.21. **PIE _*(H)edhl-_ 'elder; fir, spruce':** Lat. _ebulus_ 'elder'; Slav. _*edlь_ 'fir, spruce'; Lith. _ẽglė_, Latv. _egle_, OPrus. _addle_ 'fir, spruce', Lith. _ẽgli(u)s_ 'elder', Latv. _pa-ĕgle_ 'juniper'; comparison with Gaulish _odocos_ 'elder' and connecting it to the hypothetical root_*edh-_ 'sharp' appears highly doubtful; see Walde, 189; Fraenkel, 118; ÈSSYa: VI, 15; Toporov

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[15] Hurrian is the source of Akk. _ašuḫḫu, ašūḫu_ 'fir, spruce', from which comes Sum. _asoḫ_ 'id.' (despite Liebermann 1977, 161, where the opposite direction of borrowing is presumed).

1975, 56-57; **PNC **ˀăjʒăłħV* 'rowan; cornel':** PA **ˀAzAl* 'rowan' > God., Cham. *azal* and others; PTsKh **ˀāsa* 'rowan'> Tsez. *asa,* Akhv. *ãsa;* PN **(ˀa)stVw* 'cornel (cherry tree)' > Chech. *stow,* Ing. *esti;* PWC **ʒ́a* 'cornel' > Kab. *za,* Abaz. *za-rə,* Abkh. Bz. *a-bgə́-ʒ́ar* and others. Comparison of the Adygh root with PEC **c̄ac̄a* 'prickle, thorn, burr' (Trubetzkoy 1930, 84) must, apparently, be declined.

This comparison is acceptable if, in PIE, 'elder' is the original meaning. The PEC root, apparently, is somehow connected with Kartv. **ancı̥l̥-* 'elder' (from which in turn later, probably through Megrelian as an intermediary, Abkhaz *amçər-bɮ́ə* 'elder' was borrowed; the presupposition of an initial kinship of the Abkhaz and Kartvelian forms (Klimov 1969, 290) is, to all appearance, unfounded.

3.22. **PIE **(a)masl-* 'apple'** (a form, presumably reconstructed on the base of Lat. *mālum)*: Gk. μῆλον, Hitt. (with metathesis) *šamluw(a)-;* on the Iranian forms see below; see Ivanov 1978, 160-162 for a somewhat different reconstruction—**(s)m(ā)l-;* **PNC **ˁälmćə(-a)* 'apple; medlar':** PL **ħämč* 'apple' > Arch. *alnš,* Tab. *vič,* Ag. *ħač,* Lezg. *ič,* Kryz. *ječ* and others; Khin. *mɨč;* Darg.**hinc(i)* > Urakh. *ˁinc* and others 'apple'; Lak *hiwč* 'id.'; PTs **ˀẽš:* 'apple' > Hin. *iši,* Inkh. *ẽš,* Hunz. *ẽš* and others; Av. *ˁeč* 'apple'; PA **ˀimči* 'apple' > Akhv. *eče,* And.*inči,* Cham. *miči* and others; PN **ħamc* 'medlar' > Chech. *ħamc,* Ing. *ħamisk* < **ħamc-ịḳ* [with dim. suffix]); PWC **bV-c̄ʷV* 'medlar' > Abkh. *a-bac*^{v}, Ub. *brəc*^{w} [with an unclear *-r-*], Ad. Shaps. *nā-pca*); cf. as well Hurr. *ḫinz*^{u}*/orə* 'apple', whence Arm. *xnʒor* is borrowed).

The history of the Indo-European names for apple is exceptionally confused. An undoubted relationship to the Lat., Gk. and Hitt. forms examined above is seen in OIran. **(a)marna-* 'apple', reconstructed on the basis of a comparison of present-day Iranian forms (Steblin-Kamenskij 1982, 103, with references); it must be taken into account that the reconstruction **(a)mahr-na* < **(a)masl-* is also possible. The Proto-Iranian form **amahl-* (prior to the transition **l* > *r*) could serve as the source, firstly, of polysyllabic Indo-European forms (**amlo-/*ablo-* > OInd. *amra-ḥ* 'mango tree', *amra-m* 'fruit of the mango tree', Slav. **ablo* 'apple', Lith. *obuolỹs,* OHG. *apful,* Ir. *aball* and others; on the possibility of the derivation **-bl-* < **ml-* in the present case see Ivanov 1978, 161), and, secondly, of the Turkic forms (Turk. **alma, *ālima*); the Finno-Ugric forms—Finnish *omena,* Mordovian *umar*—apparently were borrowed from Iranian in a later era.

The reconstructed Indo-European proto-form **amas-l-* (in Hitt. metathesis needs to be presumed: **(a)mas-l-* > **sam-l-*) directly correlates to PNC **ˁälmćə,* with suffixal broadening — **ˁälmćə-lV* (cf. the Hurr. form *ḫinz*^{u}*/orə* < **ˁälmćə-lV*). Pointing to a similar suffixal formation as well is the Kartv. form **wašl̥-* 'apple', in all likelihood having a North Caucasian source (concerning initial *w-* cf. words of the type Tab. *vič*, Lak *hiwč*, where forms such as these are the result of the regular development of **ˤälmćə* > **ˤälwćə* > *ˤwälćə*). We note that also, apparently, having an East Caucasian source as well is Sum. *ḫaš-ḫur* 'apple tree, apple'. Recently Vyach. Vs. Ivanov has brought as well into the comparison with the root under discussion Hatt. *ša-wat* 'apple tree', *ḫa-wit* 'to be similar to an apple' (Ivanov 1983, 134), but the possibility of a direct correlation to PWC **bVč̄*^{w}*V* (see above) and to Hatt. *wat/wit* requires further research.

3.23. **PIE **(H)enk*^{w}*-* 'a kind of cereal':** Slav. **ęčь-my* 'barley'; Gk. ὄμπνη, ὄμπη 'food; feed, provender; grain, seed'—with the etymology of Charantier (*KZ*, 40, 464) appearing to us the most probable, see below; **PNC **ˀəlmqqwV* 'barley':** Av. South. *oq* 'barley'; PHB **ˀõχ* 'barley' > Hunz. *oh*, Bezht. *õχ*, Akhv. *ũqa* 'a kind of oats'; PWC **q́I*^{w}*V* 'barley, millet' > Ub. *χ*^{w}*a* 'barley', Ad., Kab. *ħa* 'barley', PAT **q*^{w}*ə-ʒ́* 'millet' (a construction with the root **ʒ́ə* 'grain, seed') > Abkh. Bz. *á-χ*^{w}*ʒ́*, Abaz. *q*^{w}*ʒə*.

The presently commonly accepted derivation of Slav. **ęčьmy* 'barley', **ęčь-nъ* 'barley (attrib.), barley (meal)' from PIE **ank-* 'bend, bow' ('because the ripe ears of barley bend over')(Berneker: I, 286; Vasmer: IV, 571; *ÈSSJa*: VI, 63-64), has a distinct folk-etymological character (in this instance for some reason the impossibility of the phonetic development **ank-* > Slav. **ęčь-* is forgotten; the expected form would be **ǫčь-my*). Together with this the derivation of Gk.ὄμπνη from PIE **Hop-* 'work; riches, wealth' and the direct comparison with forms of the type OInd. *apnas-* (see, for example, *WP*: I, 175; Frisk: II, 390-391) also appears to be unsuccessful (the nasal in the medial (Inlaut) position remains unexplained). In the face of all this a comparison or rapprochement of the Slavic form and the Greek form seems irreproachable as to form and semantics as well.

4. NAMES OF IMPLEMENTS AND TOOLS, AND ARTICLES OF MANUFACTURE AND EVERYDAY USE

4.1. **PIE **ag*^{w}*(e)sī* 'axe':** Goth. *aqizi*, OEng. *acus*; Gk.ἀξίνη; Lat. *ascia* (*WP*: I, 39); **PWC **ĝ*^{w}*aš*^{w}*V* 'axe':** Abkh. *a-jg*^{w}*ə́š*^{v} 'axe with a small nose-like protruberance', Abaz. *g*^{w}*aš*^{w} 'hatchet'; Ub. *ǵaš*^{w}*a* 'axe'.[16]

PAK **waš́ə́* '(wood-) chopper' (Ad. *waš́ə*, Kab. *waś*) has to be considered a comparatively late Iranianism (cf. Osset. *wäs*, OInd. *vāçi*) and thus be set apart from the other West Caucasian forms (cf. Shagirov 1977: II, 94).

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[16] It is not wholly clear how PWC **ǵ*^{w}*aš*^{w}*V* correlates with PEC **ḳāčwV* 'hammer; stick' (PL **ḳaš* > Ag. *ḳaš* 'sledge-hammer', Lezg. *ḳaš* 'hammer', Kryz. *ḳäš* 'shepherd's staff' and others; Hunz. *ḳuča* '(small) hammer'; Chech. *kāčal* 'mill hammer').

4.2. **PIE **(H)anətā* 'door jamb':** Lat. *antae* 'door jamb', '*latera ostiorum*'; OIc. *ond* 'ante-room'; OInd. *ātā, ātāḥ* 'door frame', Avest. *a*^{i}*θyå:* (acc. pl.) 'door jambs'; Arm. *dr-and* 'id.'; see *WP*: I, 59; Mayrhofer, 72; Walde, 34; Vries, 289; **PEC **ʕŏnc̣c̣V* (~*ʔ-*) 'door':** Darg.**ʔunc̄a* > Chir. *unc̄a*, Ak. *unza* and others; Lak *nuz* 'door (one–folded)'; PTS **ʔãc(u)* 'door' > Tsez. *ac*, Inkh. *ãc*, Hunz. *ə̃cu*; Av. *nuc̣á* 'door'; PA **hinc̣u* 'door' > Akhv. *inc̣u*, Tind. *hinc̄u*, And. *hinc̣u* and others.

4.3. **PIE **(H)edhro-* 'fence':** Germ. **eđra-* > OEng. *eodor* 'fence', OHG. *etar*, OIc. *jǫðurr* 'upper horizontal rail of a fence'; Slav. **odrъ* > OSlav. *odrъ* 'flooring, bed', Rus. *odr* 'couch, bed, flooring', *odrina* 'mow (n.)', cattle shed, sheep shed' and others. Less promising with regard to this isogloss is Gk. ὄστριμον 'stall, cattle shed, sheepscot' for phonetic reasons. See *WP*: I, 121; Vasmer: III, 123-124, where other (doubtful) etymologies of the Slav. form are considered; **PEC **HaʒʒārV* 'enclosure, pen, fold':** PL **ʔac̣ar* > Tab. *aƚur*, Rut. *addar* 'enclosure, pen, fold'; PN **ʒʔār* 'fence, wattle fence' > Chech., Ing. *zʕar*.

4.4. **PIE **pert(h)-* 'stick':** Arm. *ort`* 'vine, tendril'; Gk. πτόρθος 'sprout, shoot, sprout just out of the ground'; Lat. *pertica* 'pole, perch' (*WP*: II, 49; otherwise see Walde, 63); more doubtful with regard to this isogloss is OInd. *ka-pr̥th-* 'penis' and Slav.**prǫtъ*, although a more convincing etymology for the latter has not been proposed (Vasmer: III, 390); **PEC **bVrVƚV* (~**w-*) 'stick':** Av. *búrdi* 'small siskin; baluster'; PA **birVda* > Kar. *berda* 'pole', Bagv. *berda* 'stick' and others; Bezht. *bujda* 'stick, baton for a marriage procession'; Darg Ak. *barda*, Chir. *baraƚa* 'axe' and others.

4.5. **PIE **n̥si-* 'sword':** OInd. *así-* 'sword, broadsword', Avest. *aŋhū-*; Lat. *ensis* 'sword' (*WP*: I, 324); **PNC **nićV* 'sickle, knife':** PTsKh **nišu* 'sickle' > Tsez., Gin. *neš:u*, Inkh. *nišu*; PA **ničo* 'sickle' > And. *ničo*, Akhv., Tind. *niča* and others; with metathesis PL **čin* 'sickle' > Kryz., Bud., Tsakh. *čin*; PWC > Ub. *caná* 'sabre'[17].

4.6. **PIE **k̂om-* (~*-a-*) 'cover, jacket, shirt':** OInd. *çāmula-, çāmulyá-* 'woolen shirt'; Lat. (Late) *camisia* 'shirt'; Germ. **hama-* > OIc. *hamr* 'cover, jacket, skin, hide', **hamiƀja-* >OHG. *hemidi* 'shirt' and others, Walde, 88; Vries, 208; *WP*: I, 386[18]; **PNC **χamV* 'skin, hide; cloth, fabric':** PL **χam* > Tab. *χam* 'skin, hide', Ag. *χam* 'skin', Lezg. *χam* 'skin, hide, crust, bark'; Av. *χam* 'cloth, fabric, linen, sackcloth'; PA **χ̱Ami* > Kar. *χ̱ame*, Akhv. *χ̱ani*

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[17] A possible Hurrian parallel for this root is reflected, probably, in Hitt. (< Hurr.?) *zina-* 'scissors'.

[18] Of little likelihood is the proposal of I. Teubner (Teubner 1977) that Germ. **hamiƀja-* is borrowed from North Iranian **kambicuk-*, **kambicik-* 'clothing made of hemp' (the traditional etymology of the Germanic word in this connection is not even mentioned).

'cloth, fabric'; PWC _*tqamə_ 'hide, fur' > Ub. _t̠χamə́_ 'hide, fur', Abkh. _a-χamə́_, Abaz. _qamə_ 'fur coat'.

We note also Kartv. _*qaml̥-_ 'hide (of sheep, goat)' (see Klimov 1963, 263; note there also a comparison with Abkhaz).

4.7. **PIE _*k̂ūl(o)-_ 'spear, point, spike':** OInd. _çūla-, çūlā_ 'spear, lance, sharp stake'; Arm. _slak`_ < _*sul-ak`_) 'spear, dagger'; OIr. _cuil_, Lat. _culex_ 'flea, mosquito' (< 'pricking'?) (_WP_: I, 465); the remaining forms that were proposed, collected under the general hypothetical root _*k̂ū-_ 'point', are hardly relevant here; **PEC _*ć̣əwlɨ_ 'point, arrow':** Lak _c̣ila_ 'knife', Av. _č̣or_ 'arrow, ramrod', Btsb. _c̣ur_ 'arrow', PTS _*c̣ulu_ 'arrow' > Bezht. _c̣ulu_ and others.

4.8. **PIE _*klāu̯-/*klĕ̄u̯-_ 'key, hook for a lock':** Gk.κληΐς 'key', Lat. _clāvis_, Slav. _*ključь_ and multitudinous other forms (_WP_: I, 492-494); **PNC _*ḳułe_ 'key, hook, lock':** Lak _ḳula_ 'key', Av. _ḳul_ 'key', Kar. _ḳula(-laχa)_ 'lock' and others; PWC (with metathesis) >Abkh. _a-lə́ḳ^w_ 'lock (of a firearm), lock'. The West Caucasian antiquity of this root is attested by Hattic _kaluḫ/qqalu_ 'bolt, bar' (Ivanov 1983, 136).

For this root it is necessary to point out as well Semito-Hamitic parallels (_*klʔ_ 'to lock' (Illič-Svityč 1964, 6), and also Kartvelian (Laz _ḳila, ḳola_, Megr. _ḳila, ḳəla_, Svan _ḳəl_ 'key', as well as Megr. _ḳəlua_, Svan _ḳl-_ 'to lock' (Illič-Svityč 1964, 6; Klimov 1981, 169). The direction of borrowing in this particular case is, at the present time, difficult to determine.

4.9. **PIE _*k^{w}er-_ 'vessel':** OInd. _carú-_ 'cauldron', 'earthenware pot'; OIr. _coire_, Welsh. _pair_ (< _*k^{w}eri̯i̯o-_) 'cauldron'; OIc. _hverr_, OEng. _hwer_ 'cauldron'; ? ORuss. _čara_ 'cup, goblet'— although for the latter an origin through borrowing is not excluded as well (Vasmer: IV, 316; Mayrhofer, 377; Vries, 272); **PEC _*ḳwărV_ 'clay vessel':** Bezht. _ḳera_ 'clay vessel', Darg._*ḳ^{w}arV_ 'large clay vessel'; Lak Bartx. _ḳ^{w}ara_ 'vessel for flour; oven for bread'.

West Caucasian parallels to this root are absent, but cf. Hatt. _karam_ 'wine vessel' (see Ivanov 1983, 136; borrowing of the Hatt. word from Sem._*krm_ 'wine' appears to us doubtful).

4.10. **PIE _*g^{w}erən-/*g^{w}rāu̯n-_ 'millstone':** Goth. _qaírnus_, OIc. _kvern_; Lith. _gìrnos_ 'hand-mill'; Slav. _*žr̥ny_ 'millstone'; OInd. _grāvan-_ 'stone for pressing Soma (mythical intoxicating drink)'; Arm. _erkan_ 'millstone'; OIr. _braó, bró_ 'millstone' and other Celt. words (_WP_: I, 685); **PEC _*χIwĕrV_ mill, millstone':** PN _*ħar, *ħarjV_ > Chech. _ħer, ħajra_, Ing. _ħajra_, Btsb. _ħajr_ 'mill'; PA _*χ^{w}ArV-_ > Bagv. _χ^{w}ar-_, Kar. _χ^{w}ar-_ and others; Lak _hara(-qalu)_; Khin. (with metathesis) _zoχ_ (< _*roχ_) 'millstone'; PL _*reχ̱I^{w}a_ > Lezg. _reʁ^w_, Tab. _raʁI, raʁI-in_, Ag.. *raχ*, Rut. *ruχI*, Tsakh. *joχ̱Ia* 'mill', Arch. *deχI*^{w} 'millstone'.

The PEC base is verbal (cf. PL **reχ̱I*^{w}*a* 'to grind, to mill', Av. *χ̱e-*, Tind.*χ*^{w}*-an-*, Chech., Ing. *aha* 'to grind, to mill'); there are West Caucasian parallels as well (PAK **ħaga* 'to grind, to mill') and others.

Derivation of the PIE form from Sem. **grn* (Illich-Svitych 1964, 5) should be rejected, in that the Semitic root signifies not 'to hammer, to spread' but 'threshing floor, place for threshing'. The Kartvelian forms have, probably, an Indo-European provenance (Laz *ʁurni*, Georg. Adzh. *ʁurne* 'milling chute') (Klimov 1981, 169).

4.11. **PIE **k̂seul-* 'beam, post, piece of wood':** Gk.ξύλον 'wood, beam'; Lith. *šùlas* 'post, jamb, doorpost', OPrus. *sulis* 'pole, upright'; Slav. **šulo* 'post, wood block, (short) log, log'; OHG. *sūl* post, Goth. *sauls* 'column, post' (Frisk: II, 338-339; *WP*: II, 503; Vasmer: IV, 484-485); **PEC **č̣ɨwłu* 'beam':** PL **č̣ul* > Tab. *č̣ul* 'beam', Ag. *č̣il* 'beam, thin log', Lezg. *č̣ul* 'beam' and others; Darg. *č̣ala* 'pole'; 'knitting needle, fork'; Lak *č̣ula* 'beam, squared beam or timber, log'; Hunz. *č̣elu* 'diametrical or transversal crossbeam'; Av. *č̣alu* 'log, beam'; PN **č̣ar-iḳ* 'transversal ceiling crossbeam' > Ing. *č̣arga*, Chech. *č̣erg*.

4.12. **PIE **sel-* 'room, dwelling':** OHG. *sal* 'hall, dwelling' and other Germ. words; Slav. **selo*; see Walde, 582; *WP*: II, 502-503; Vasmer: III, 596. It is very probable that Hitt. *šeli-* 'shed, barn' belongs to this same root; see Friedrich: II, 190, cf. especially Germ. words of the type OIc. *sel* (**salja-*) 'shepherd's cabin, hut, shack'; **PEC **čalłe* 'enclosure, pen, sheepfold, fence':** PL **čal* > Rut. *čal* 'enclosure, pen, sheepfold', Ud. *čal* 'fence (to keep in)', and others; Av. *čalí* fence (to keep out), wattle fence; fence (wooden)'; Darg.Ak. *čalli* 'fence (wooden)'; Tind. *čali* 'enclosure, pen, sheepfold' and others.

4.13. **PIE **Hu̯erk-* 'wheel':** Hitt. *ḫurki-*, Tokh. A *wärkänt-* 'wheel'; see Ivanov 1979, 146-147; the other Indo-European parallels (Ivanov 1975, 404) are not completely hopeful; **PNC **ħəlǩwV (~ -ɨ-, -o-)* 'vehicle':** Darg. *urkura* 'a kind of bullock cart', Av. *hokó* 'a kind of bullock cart, cart (four-wheeled)'; And. *ink*^{w}*a* 'kind of bullock cart'; PAK **ǩ*^{w}*ə* > Ad. *k*^{w}*ə*, Kab. *g*^{w}*ə* 'bullock cart, cart (four-wheeled); on the possible original meaning of 'wheel' inherent in the Adygh form, see Yakovlev (Jakovlev 1948, 281).

A. K. Shagirov (Šagirov 1977: I, 113) matches the Caucasian material to PIE **u̯oĝho-* 'vehicle, carriage (for loads), vehicle, carriage', which is inadmissible according to phonetic considerations. The root in question, apparently, was represented in Hurro-Urartian, cf. Hitt. *ḫulukanni-* 'light carriage', Akk. *ḫuluganu* (*ḫiluganu*), a borrowing from a Hurrian source (judging by the shape of the base in *-nV*, typical for Hurrian). The presence of *-l-* in the presumed Hurrian form supports the reconstruction **-l-* in PNC (which was performed according to systematic considerations, namely according to the correspondence Darg.*-r-*: Av. *-Ø-*: And. *-n-* in the medial position, in combination with a following velar consonant.)

4.14. **PIE **gʷeru-* 'spit (for roasting), point, spike':** Lat. *veru* 'spit; javelin, lance'; OIr. *biur* 'id.' and other Celtic words; Goth. *qaíru* 'stake; needle, sting'; Avest. *grava-* 'stick'; see Feist, 386 and others; **PWC **gʷərə* 'needle, knitting needle':** Abkh. *a-gʷə́r*, Abaz. *gʷrə* 'needle, knitting needle'; PAK **gʷərə-ʁ* 'pintle' > Ad. *gʷərʁ*, Kab. *gʷərəʁ*; (Abdokov 1973, 46). In the first part of the Adygh word one must not single out the component **k̄ʷə* 'aruba (a kind of bullock cart)', despite Shagirov (Šagirov 1977: I, 119); in the Adygh form in such a case as this one would expect *kʷ*-.

5. OTHER WORDS

5.1. **PIE **ār(H)o-* 'space':** Lith. *óras*, Latv. *ars* 'space, open place, open area'; OInd. *āre* 'in the distance, far off', *ārā́d* 'from a distance'; Lat. *ārea* 'free space; threshing floor'; see Walde, 42 and others. Not excluded as a possible connection here is Hitt. *arḫa-* 'courtyard', Alb. *arë* 'field' (Hamp 1958), although in the Albanian form the reason for the shortened reflex of the first vowel is unclear. See also Orel (1984: 319); **PEC **ˀār(H)V* 'field, plain':** Lak *ar* 'plain'; Tab. *ar* 'marsh'; PN **ˀārV* > Chech., Ing. *ārē* 'floor; plain, steppe'.

5.2. **PIE **(H)aĝro-* 'field':** OInd. *ájra-*; Gk.ἀγρός; Lat. *ager*; Goth. *akrs* and others (*WP*: I, 37); **PEC **ˁŭć̣ćŭrV* (the same with metathesis **ˁŭrŭć̣ćV*) 'meadow, glade, clearing':** PL **č̣ura* (~-*o*-) 'common pasture, meadow' > Tab. *č̣ur* 'pasture', Ag. *č̣ir* 'meadow', Lezg. *č̣ur* 'common pasture, pasture (where cattle graze)'[19], meadow, pasture (where cattle rest the night)'[20], Rut. *č̣ir*, Tsakh. *č̣ija* 'earth'); PA **hAč̣č̣a* 'meadow, grass-plot'; Chech. *irzū* 'rooted out, stubbled earth; seeded, sowed forest clearing').

V. M. Illich-Svitych (Illič-Svityč 1964, 4) proposes for the Indo-European word a Semitic origin (Sem. **ḥḏr* 'enclosed, fenced-in plot, courtyard'), but this has little probability for semantic reasons (PIE **aĝro-* does not, as it were, incorporate the concept of 'enclosing'). Comparing the Semitic form with PEC **HaʒʒārV* 'enclosure, pen, sheepfold, fence' (see above) appears more likely, with which we in turn compare PIE **edhro-* 'fence'.

5.3. **PIE **dholo-* 'valley':** Goth. *dal*, OHG. *tal* and other Germ. words; Slav. **dolъ* (*WP*: I, 864). The Greek parallel is doubtful—θόλος 'cave, round structure, round-shaped paired bath' (Frisk: I, 677); **PEC **ʒʒəlHV* 'plain, plateau':** PL **ç̣ol* 'low place, depression' > Lezg. *ṭul*, Rut. *dɨl*, Kryz. *tul*; Av. *ç̣or* 'plain'; Cham. *ç̣edo* < **ç̣erHo* 'table-land, plateau'.

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[19] Rus. выпас [RT].

[20] Rus. пастбище [RT].

5.4. **PIE **mar(o)ĝ-* 'boundary, border':** Avest. *marəza-* 'boundary, border, bordering region'; Lat. *margo* 'edge'; OIr. *mruig, bruig* 'boundary, border' and other Celt. words; Goth. *marka,* OHG. *marcha* 'boundary' and other words (Walde, 369; Feist, 347); **PEC **mŏrqqwV* stripe, strip, mark':** PL **marχ̱*^{w} 'strip of mowed grass' > Arch. *maχ* 'part of a meadow apportioned to one woman for mowing', Lezg. *marʁ*^{w}, Tab. *marʁ*^{w}*al,* Bud. *merʁ* 'strip of mowed grass'; Av. *muq* 'line, mark'; PTs **muq* >Inkh. *muq* 'wrinkle; row'; Bezht. *muq* 'stripe, strip'; PA **muqV* > Akhv. *muqu* 'line (of text),' God. *muqi* 'stripe, line' and others; PN **moʁV* > Chech. *moʁa,* Ing. *muʁ* 'line (of text)'.

5.5. **PIE **(H)areĝ-/(H)r̥ĝ-* 'silver':** OInd. *rajata-,* Avest. *ərəzata-,* Lat. *argentum,* OIr. *argat,* Arm. *arcat`*; with another suffix Gk. ἄϱγυϱος (*WP*: I, 82); **PNC **ˀĕIrVco* // **ˀoIrVc(w)e* 'silver':** PL **ˀars-* > Arch. *arsi,* Tab., Ag. *ars;* Darg. *arc;* Lak *arcu;* PTsKh **ˀos* > Inkh., Khwarsh. *os;* Av. *ˁarac;* PA **ˀorci* > And. *orsi,* Akhv. *arči,* Tind. *asi* and others; PWC **rVź*^{w}*V-n* / **rVś*^{w}*V-nə* > Abkh. Bz. *a-raʒnə́,* Abaz. *rəzna;* Ub. *daš*^{w}*anə.* Irregularly PAK **ƚəẑənə́* > Ad. *təẑən,* Kab. *dəźənə* 'silver' (**ƚəźənə* is expected). To this is related, undoubtedly, Hurr. ^{u}*/ošḫ*^{u}*/o(-ne)* 'silver' with the regular development **-rc-* > *-sḫ-*; see D'jakonov, Starostin 1988.

The Indo-European name for silver is usually said to derive from the root **Harĝ-* 'light, bright' (cf. OInd. *arjuna-,* Gk.ἀϱγός, Hitt. *ḫarki-* and others). If this is correct, one must consider the North Caucasian root to be an Indo-Europeanism. However, the fact stands out that the Indo-European forms have the meaning 'silver' only in suffixed form, whereas the majority of the Caucasian forms have no suffixes. For this reason, for PIE **(H)areĝ-* 'silver' the possibility of a secondary comparison with the root **Harĝ-* 'light, bright' is not ruled out.

R. Lafon (Lafon 1933), and before him P. Charaya (Čaraja 1912), compared the North Caucasian forms with Kartvelian ones (Kartv. **wercɪχ̥l-* 'silver' [Klimov 1963, 83]). To us the Kartvelian form appears to be a relatively late Hurrianism (Hurr. ^{u}*/ošḫ*^{u}*/o-* is assumed to be early Hurro-Urartian [prior to the loss of *-r-*] **orcḫ-,* corresponding rather exactly to the Kartvelian form); despite V. V. Ivanov (Ivanov 1983, 105) the sound-consonance of Hurr. ^{u}*/ošḫ*^{u}*/o-* 'silver' and Lith. *auksas* 'gold' (and other Indo-European forms related to the latter) is, probably, coincidental.

5.6. **PIE **u̯es(no-)* 'worth, price, to sell':** OInd. *vasna-;* Gk.ὦνος; Arm. *gin;* Lat. *vēnus;* Slav. **věno;* Hitt. *u̯aš-* 'to purchase', *u̯ešii̯a-* 'worth'. See *WP*: I, 311; Friedrich: III, 248-253; on the belonging of the Slav. form here see Trubachev (Trubačev 1975); **PNC **u̯VjcV* 'sheep, worth'**: PN **ˀust-iʁ-* 'ram' > Chech. *üstaʁ,* Ing. *ustaʁa,* Btsb. *ujstχ;* PWC **wasa* > Abkh., Abaz. *wasa* 'sheep'; Ad., Kab. *wāsa* 'worth, cost'.

A complex case: G. Deeters (Deeters 1957) considers the West Caucasian forms to be borrowings from Indo-Iranian (in fact, for Indo-Iranian one may reconstruct **wasā(-ka)* 'worth, price' on the base of Pers. *behā*, MPers. *vahāk* 'worth' [Horn 1893, 55]). However, the semantic development 'worth' > 'sheep' appears to us of small probability (the reverse is far more natural). Moreover, the antiquity of the meaning 'sheep' in this root would seem to be supported by Hatt. *(wa)-zar-* 'sheep' (on a comparison of the latter see Ivanov 1983, 142), which, in addition, sheds light on the morphological structure of the formation in question, indicating that **uV-* is historically a prefix. It is not out of the question that Kartvelian **wa*c_1*-* 'ram' also has a North Caucasian source (Klimov 1963, 82). In such a case it follows that the reverse direction of borrowing should be recognized (from North Caucasian to Indo-European).

5.7. **PIE **mizdho-* 'payment':** OInd. *mīḍhá-*, Avest. *mīždа-*; Gk.μισθός; Goth. *mizdō* and other Germ. words; Slav. **mьzda* (*WP*: II, 301); **PNC **maśwV (*~ə-)* 'worth, trade':** PL **mašā* >Arch. *mas* 'worth', Tab. Dyub. *mašu qāvqus* 'to purchase (perf.)', *mašu duvus* 'to sell (perf.)', Lezg. *mas* 'worth, cost', *masa gun* 'to sell (imperf.)', *masa qač̱un* 'to purchase (imperf.) and others; Darg. Ak. *mas* 'article of trade, good, ware, commodity'; Lak *maša* 'trade'; PWC **ś̌ʷa* 'worth, price', to pay' > Abkh. *a-šᵛa-ra*, Abaz. *šʷa-ra* 'to pay', Ub. *šʷa* 'worth, price'.

The initial syllable **ma-* in East Caucasian must be a prefix; given that, the secondary loss of **ma-* in West Caucasian is not ruled out (verbal roots beginning with *m-* are absent here). In the Indo-European form one can observe the component **-dho* (< **dhe(H)-* 'to put, to place') and reconstruct an original combination of **mis-* 'payment' + **dhe(H)-* 'put down, place'. The first component **mis-* (or in its hypothetical full stage), **meis-* or **mois-*), coordinates or links up well with PNC **maśwV*, as it seems. How does PIE **moiso-* 'ram, sh̆eep' relate to this?[21].

5.8. **PIE **k̂orkā(-lā)* 'gravel, pebble':** OInd. *çarkarā, çarkara-* 'gravel, pebble'; Gk.κϱόκη, κϱοκάλη 'pebbles' (*WP*: I, 463). Probably, to this it is necessary to relate Germ. **haruga-* 'pile of stones' (with a secondary meaning of 'altar', 'sacred place') < **k̂ork(r)ó-*); PNC ***ḳĕrḳĕlV / *ḳĕrḳĕn V 'pebble', grain, seed, kernel (dim.); egg':** PL **ḳăḳäl* 'pebble, gravel' > Lezg. *k(i)ḳal*, Tab. *ḳeḳel*, Rut. *ḳɨḳal*, Tsakh. *ḳaḳalaj*, Kryz. *ḳɨḳäl*; PHB **ḳeḳe* > Hunz., Bezht. *ḳeḳe* 'grilled, roasted, broiled grain'; Av. *ḳorḳonu* 'grape; berry'; PA **ḳorḳonV* 'egg' > God. *ḳ́arḳ́anu*, And. *ḳorḳon* and others; PWC > Ad. *ç̌́anç̌́a*, Shaps. *ḳanḳ́a* 'egg'. Cf. as well Hurr. *kirikiriannə* 'bump, lump (on the skin').

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[21] It is interesting that Darg. *mas* besides the meaning 'article of trade, commodity' also has the meaning 'ram'. It is not ruled out that in fact 'ram' was the original meaning of this root and that we are observing here the very same semantic evolution as in the preceding case.

A similar root is present in the Kartvelian languages as well (Kartv. **ḳaḳal-* 'walnut', in Megr. 'grain, seed, core, kernel, piece' (Klimov 1963, 105), and a North Caucasian origin is not ruled out for it; Arm. *ḳaḳal* 'large nut' undoubtedly comes from Kartvelian (Kapancjan 1952, 36-37). G. A. Klimov in several works calls attention to the similarity of the Caucasian forms (besides, as well, to a comparison of the Kartvelian and West Caucasian forms, but, however, besides, as well, a comparison only of forms in the Lezgian languages alone (Klimov 1963, 105; 1969, 292; 1972, 352; Vinogradova, Klimov 1979, 158). However, the attempt to derive the Lezgian words from Armenian (in the latter work), apparently, has no base of support. Cf. also Šagirov 1977: II, 133.

In connection with the forms without medial *-r-* attention may be directed as well to PIE **kaghlo-* 'pebble' (Gk. κάχληξ 'stone; rock, pebbles', OHG. *hagal* 'hail' and others; see *WP*: I, 338, of which the relationship to this root is not wholly clear.

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5.9. **PIE **keuk-* 'heap, pile':** Goth. *hiuh-ma* 'heap; large quantity', *hūhjan* 'pile up, collect', OIc. *haugr* 'hill' and other Germ. words; Slav. **kuča* 'pile'; Lith. *kaũkas* 'bump (from an injury), lump', *kaukarà* 'hill'; see *WP*: I, 371, where many more words with a meaning of 'crooked, bent, to bend, to bow' and so on are listed, words seemingly having no relation to this root; **PEC **q̇q̇wĪlq̇q̇a* (~ *-ɨ̄-*) 'group, large quantity; hill, elevation':** Lak *q̇uIq̇a* 'group' (Lak > Darg. *q̇uq̇aI* 'group'); Hunz. *q̇oq̇ol* 'crowd'; Av. *q̇oq̇a* 'detachment, detached force, group', PA **q̇wiq̇a* > God. *q̇uq̇o* 'group', Cham. *q̇oq̇īla* 'gather into groups (of people)'; belonging here as well, apparently, are Darg. *q̇alq̇* 'hill' and PN **bʔōʁa(m)* (*bʔ-* regularly < **q̇w-*) 'post, pole, pillar, column'.

5.10. **PIE **k̂i̯āu̯ero-* 'north, north wind':** Lat. *caurus* 'north wind'; Lith. *šiáurė* 'north', *šiaurỹs* 'north wind'; Slav. **sěverъ* 'north'; OHG. *skūr* 'Ungewitter' (*WP*: I, 377; Walde: 108); **PEC **ccōjwɨ̄lhV* 'winter, autumn':** PA **čibirV* 'winter' > Akhv. *čibera*, Tind. *čibar*, Ba. *šibara* and others; PL **cowɨl* 'autumn' > Tab. *č̄ᵛul*, Ag. *cul*, Tsakh. *cuwul*, Arch. *soƚ-*, Lezg. *zul*; PTs **šɨbə(r)* > Tsez. *sebi*, Bezht. *sibora*, Hunz. *sɨbər* ''autumn'; Btsb. *sṭabo* 'autumn' and others; the West Caucasian parallel (PWC **bẑ̌ə* > Ub. *bẑ̌a* 'winter', Ad. *bẑ̌əħa*, Kab. *bźəħa* 'autumn') gives rise to doubt not so much due to the loss of the sonants (a regular development) as to the not-quite- clear correspondence **cc* : **ẑ̌*.

5.11. **PIE **k̂ekʷ-* 'manure, dung':** OInd. *çákr̥-t*, Gk.κόπϱος, Lith. *šìk-ti* 'cacare' (*WP*: I, 381; Fraenkel, 982). Here Hitt. *šakkar* (with a variant *zakkar*) 'manure, dung, faeces, excrement' should be seen as related: the morphological parallelism of OInd. *çákr̥-t*, gen. *çaknáḥ* = Hitt. *šakkar*, gen. *šaknaš* is obvious, and cases of PIE **k̂* reflected in

Hitt. as *š* also are not uncommon, cf. Hier.-Hitt. *aśuwa-* 'horse', Hitt. *šamana-* 'cornerstone, foundation' and others; **PNC **čVq̇q̇IwV* 'faeces, excrement, mud':** Tab. *čᵛqI-ur* 'excrement, droppings', Rut. *ç̌uq̇Iʷ* 'mud on the clothing'; PWC **çəq̇ʷə (~ *ç̌-)* 'droppings', Ub. *çaq̇ʷ* 'cow droppings', Abaz. *-q̇ʷəç* 'manure, dung'.

5.12. **PIE **tʷer-* 'curdled milk, curds':** Avest. *tūiri-* 'milk that has curdled, whey', OInd., Prakr. *tuvara-* 'astringent', Apabhramsha *tūra-* 'cheese'; Gk.τῡϱός 'cheese'; Slav. **tvar-ogъ* 'lac coagulatum'; see *WP*: I, 710, where the words examined are totally arbitrarily related to PIE **tēu-* 'to swell' (Vasmer, v. 4, 31; Frisk: II, 948; Mayrhofer, 516; Turner, 336); **PNC **ˀV-twVr-* 'become rolled up, to turn sour, to rot, putrefy':** PL **ˀitʷar-* > Arch. *tar-as* 'to roll up (of milk)', *tʷ-as* (< **tʷr-as*) 'to fade, droop, wither', Bud. *ˁatar* 'to ferment, go sour', Lezg. *arut-iz* 'to roll up (of milk)'; Darg. Urakh. *-irt-* 'to become thickened'; Lak (redupl.) *tata-* 'to thicken'; Av. *-et-* (< **-etr-*) 'to become rolled up', *tur-* to rot, putrify, decompose'; PA **it(ʷ)it(ʷ)-* > Kar. *-etit-* 'to sour, turn sour', **tʷir-* 'to rot, putrefy' > Kar. *tor-*, Tind. *tor-d-* and others, arbitrarily **tʷiri* 'brine for cheese'; PN **-ăt-* > Chech. *-at-*, Btsb. *l-at-* 'to become rolled up'; PWC **tʷa* 'pus, matter, to become rotten, fermented' > Abkh. *a-tʷá*, Kab. *wa-ta(-ps)* 'pus', Ub. *ṭʷa-* 'to become rotten, fermented (with a secondary ejective quality).

5.13. **PIE **pr̥k-* 'heat, burning coal':** Lith. *pir̃k-šnys*, Latv. *pirk-sti;* OIr. *riches* 'coal', Bret. *regez* 'heat, coal' (**pr̥ki-stā*); see Fraenkel, 506); **PWC **pərəɣə* > Abkh. *a-pərʁə́*, Abaz. *pərʁa* 'heat, burning coal'.**

The comparison is rather doubtful due to the limited spread of the root both in the Indo-European and in the North Caucasian languages (from the East Slavic languages cf., perhaps, Lak *purḳu* 'smoke'?).

5.14. **PIE **medhu-* 'honey':** OInd. *mádhu-* 'honey; sweet'; Avest. *maδu* 'berry wine'; Toch. B *mit* 'honey'; Gk. μέθυ 'wine'; OIr. *mid* 'drink made with honey' and other Celtic words; OIc. *mjǫðr*, OHG. *metu* 'drink made from honey'; Lith. *medùs* 'honey'; Slav. **medъ* (*WP*: II, 261); **PEC **hwĭmĭʒʒu* 'honey':** PL **ˀimc̱̣* > Tab. *jič̄ʷ*, Ag. *it̄ʷ*, Tsakh. *ut*, Arch. *imç* and others; Khin. *nüç;* Darg.**waða* > Ak. *warˀa*, Chir. *waza*, Kub. *wada* and others; Lak *niç;* PTS **nucə* > Tsez. *nuci*, Inkh. *nucu*, Hunz. *nucu*, Bezht. *nuco* and others; Av. *hoc̱̣ó;* PA **hunc̱̣i* > Akhv. *unc̱̣i*, Tind. *hunči*, And. *hunc̱̣i* and others; PN **moç* > Btsb. *moç*, Chech., Ing. *moz*.

The PEC form is derived from the root **mĭʒʒV* 'sweet' (cf. Darg.**muði-* > Ak. *muˀi-*, Chir. *mizi-* and others; Lak *naçu-*; PA **mic̱̣a-* > Akhv. *mic̱̣a-*, Tind. *mičā-*, And. *mic̱̣a* and others; PN **măçer-* > Btsb. *maçarin*, Chech., Ing. *merza*). In a later era the Indo-Iranian name for honey penetrated the East Caucasian languages in a new form (PEC **mäIdwV* 'a kind of drink', see above).

In view of the fact that for the Indo-European root a North Caucasian source is absolutely certain (on the correspondence **ʒʒ* : **dh* see below)—Sem. **mtḳ* 'sweet' (which V. M. Illich-Svitych [Illich- Svitych 1964, 5] considers the source of Indo-European **medhu)*—it follows that one must either consider it an Indo-Europeanism (cf., in part, such formations as OInd. *madhuka-*, Slav. **medъkъ*), or either in general not submit it to comparison. It should be noted that the East Caucasian root finds direct parallels in the Semitic and Cushitic languages (cf. Sem. **m(j)z*, Arab. *miz-r* 'a kind of beer' and others; Cush. *caxo mēz*, Kuara *mīz* 'drink made with honey'; see Militarev, Starostin 1984).

5.15. **PIE **reugh-* 'sour milk, butter':** Avest. *raoγna-* 'butter', Pers. *rōγan;* OIc. *rjōmi* 'cream', OEng. *rēam*, MHGerm. *roum* 'cream, sour cream; OPrus. *raugus* 'rennet ferment', *ructan dadan* 'sour milk', Lith. *ráugti* 'to make sour', *rū́gti* 'to turn sour', *ráugas* 'ferment (n.)' and others (*WP*: II, 357-358; Vries, 449); in the Baltic languages the root underwent a secondary contamination with **reug-* 'belch', but these roots must be distinguished one from the other; **PNC **renχwV* 'butter; milk':** PL **jimχ (~-χ̱)*(< **rimχ̱*) > Arch. *inχ* 'butter', Kryz., Bud. *juχ* 'milk'; with a regular metathesis of sonants are Darg. Chir. *nerχ,* Kub. *nēχ* and others 'butter', Lak *nah* 'butter', Av. *naχ* 'butter, fat'; Ad., Kab., Ub. *tχʷə* 'baked butter' (Adygh. and Ub. *t-* in this case may go back to PWC **r-*, making it possible to reconstruct PWC **rəχʷə;* unfortunately, the Abkh. words, which could have confirmed this, are lacking; Abkh. *a-χʷša* 'baked butter', proposed by A. I. Abdokov [Abdokov 1973, 68] and A. K. Shagirov [Šagirov 1977: II, 78], must be distinguished from this root due to phonetic considerations).

5.16. **PIE **sūr-/*sʷer-* 'sour':** OHG. **sūr* 'sour' and other Germ. words; Lith. *súras* 'salty', *súris* 'cheese'; Slav. **syrъ;* OIr. *serb,* Welsh *chwerw* 'bitter' (**su̯eru̯o-*); see *WP*: II, 513; **PNC **š:wirV* 'curds, milk and similar':** PL **š:ʷir* > Ag. *š:ür* 'liquid brynza (sheep's milk cheese)'; PN **šŭra* 'milk' > Chech., Ing. *šura,* Btsb. *šur;* PAT **a-šʷə* 'cheese' > Abkh. *ašᵛ*, Abaz. *ašʷə.*

It is not yet clear by what path this root got into several modern Iranian languages (Pers. *šōr*, Pehl. *sōr*, Sak. *sura-* 'salty' (Bailey 1967, 345; Abaev 1979, 170-171), whence it spread to Turkic (Räsänen 1969, 449) and secondarily to the East Caucasian languages (cf. Tab., Lezg. *šur* 'curds', Kryz. *šur* 'a kind of simple kvass'; Chech. *šowr* 'cheese brine, cheese pickle'—all of these are relatively new borrowings, far from claiming PEC or PNC antiquity).

5.17. **PIE **lengh-* 'shame, to put to shame':** Gk.ἐλέγχω 'to slander, to disgrace, to defame', ἔλεγχος 'disgrace, slander'; Latv. *langāt* 'to swear (maledict), to curse'; MIr. *lang* 'shame, deceit' (*WP*: II, 436; Frisk: I, 486-487); cf. also Hitt. *lenk-* 'to swear (oath), to vow' *lenka-* 'vow, oath' (Kronasser 1956, 171); **PEC **ƚimqqIV (/*rimqqIV)* 'shame;**

alarm, anxiety': PL **liwqI/*riwqI* 'shame' > Arch. *libχI*, Lezg. *reʁü*, Rut. *rɨqI*, Kryz. *reħ*; Lak *liχ̱aI-wu* 'alarm, anxiety' (> Arch.*laχ̱Iə-ṭi*), Av. *límħi* 'a guilty look, aspect, appearance', *límħ-ize* 'to look (at), watch guiltily'.

The isoglosses examined above are sufficient for an attempt at establishing correspondences between the PNC and PIE phonological systems; as is well known, a more or less regular system of correspondences can be established not only on the basis of the multitude of ancient reLatved lexemes but on the multitude of borrowings as well.[22]

1. SYSTEM OF CONSONANTISM

1.1. Labial consonants

In PNC four labial plosives are reconstructed: voiceless (aspirated) *p*, tense (unaspirated) *p̄*, voiced *b* and ejective *ṗ*, and three sonorants (*w*, *u̯* and *m*). Between PIE and PNC the following correspondences are reconstructed:

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[22] A certain number of the comparisons proposed above may prove in fact to be later borrowings (already after the breakup of PIE), insofar as contacts between the Indo-European and North Caucasian languages continued, seemingly, into later epochs as well. This especially relates to those of the Indo-European roots examined above that are attested only in a few of the daughter languages and are characterized by irregular reflexes. There is no doubt, however, that in the overwhelming mass of cases it is reasonably certain that the roots examined above are reconstructions on the PIE level.

PNC	PIE	Examples
*p	*p	3.9. (_*pwīIłV — *pel-_), 3.10 (_*pinç̣ç̣wV — *pī̆tu-_), 5.13 (PWC _*pəraγə — *pr̥k-_), 2.10 (_*pwərccV : *pērs-nā_)
*p̄	*bh	2.12 (_*p̄üggV-b- : *bhāĝhu-_), 3.13 (_*p̄ŏnqqIwe- : *bhā(u)ĝo-_)
*b	*bh-, *-u̯-	3.14 (_*bVrč̣- : *bhar(e)s-_), 3.1 (_*HVbVgV : *(H)auiĝ-_)
*ṗ	*b(h)	1.9 (_*GG(w)V̄IṗV : *gʷēb(h)-_)
*m	*m	2.13 (_*cwā̆jmi : *saim-_), 2.14 (_*ʒ́wĕmV : *stomen-_), 3.4 (_*kkärmuśV : *kermus-_), 3.22 (_*ʕäImćə : *amas-l-_), 4.6 (_*χamV : *k̂om-_), 5.4 (_*mŏrqqwV : *mar(o)ĝ-_), 5.7 (_*maśwV : *miz-dho-_), 5.14 (_*hwĭmĭʒʒu : *medhu-_)
*w	*bh-, -u̯-	3.12 (_*wēIrqwɨ : *bherəĝ-_); 1.2 (_*ħɨ̄ncwV : *ek̂u̯o-_), 1.6 (_*p̄äHäḳwV : *pek̂u-_), 2.3 (_*kwāhnɨ : *Huələnā_), 2.9 (_*ç̣ç̣əkwV : *tu̯ak-_), 4.7 (_*ç̣əwlɨ : *k̂ūl-_), 4.12 (_*č̣ɨwłu : *k̂seul-_), 5.10 (_*ccōjwɨ̄lhV : *kiāu̯ero-_), 5.12 (_*ʔV-twVr- : *tu̯er-_), 5.16 (_*š:wĭrV : *su̯er-/sūr-_), 3.10 (_*pinç̣ç̣wV : *pī̆tu-_)
*u̯	*u̯	5.6 (_*u̯VjcV : *u̯es(-no-)_)

To these rules it is necessary to append several observations.

1. In a great number of cases we observe in PIE in place of the North-Caucasian initial consonants _*p̄-_, _*b-_, _*w-_ not the expected _*bh-_ but voiceless _*p-_. Cf. examples 1.6 (_*p̄äHäƛ̣wV : *pek̂u-_), 1.10 (_*p̄Vś̄wV : *p(e)isk-_), 3.11 (_*biInḳḳwV : *peuk̂-_), 4.4 (_*bVrVt̄V ~ w- : *pert(h)-_), 1.7 (_*wāIrƛ̣ƛ̣wə : *pork̂o-_). This divergence is easily explained: in PIE the combination within one root of a voiced aspirated consonant and voiceless consonant was prohibited, as a result of which a voiced aspirated consonant before a following voiceless consonant became voiceless.[23]

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[23] In principle a different development could have taken place, namely the voicing of a voiceless consonant. In connection with this it is interesting to consider PIE _*bhū̆ĝo-_ 'goat, ram' (see *WP*: I, 189) in the capacity of a possible etymological doublet for _*pek̂u-_ (from PNC _*p̄äHäƛ̣wV_), although the difference in the vocalism is difficult to explain. Cf. also Germ. _*barha-_ 'porcus castratus', which does not have the hoped-for etymology and may reflect an archaic type of the root _*bhork̂o-_ (< PNC _*wāIrƛ̣ƛ̣wə_).

2. The sonorant _*m_ regularly corresponds to PIE _*m_ (see above), but in those instances when it is the first element of a medial cluster of consonants, in PIE we regularly have _*n_: cf. examples 2.5 (_*q̇ămq̇ə_ : _*kenk-_), 3.23 (_*ˀəlmqqwV_ : _*(H)enk^w-_), 5.17 (_*ƚimqqIV_ : _*lengh-_).

3. The sonorant _*w_ in PNC has a special status: namely, it can occur as the second element of a consonant cluster (something interdicted for the other sonorants). In an independent position (that is, in initial position, in intervocalic locations, and as the first component of a consonant cluster) its reflex in PIE is realized in the same way as that of PNC _*b_ (that is, as _*bh_ in initial position, but as _*u̯_ in other positions. In the position of the second component of a cluster it can also be reflected in P as _*u̯_ (cf. examples 1.2, 1.6, 2.3, 2.9, 4.7, 4.12, 5.12, 5.16), and apparently, 2.9 and 4.14 as well, where it is necessary to presuppose it has undergone metathesis. However, the glide character of the pronunciation of _*w_ in these cases in PNC (cf. the treatment of similar clusters as labialized consonants in many daughter languages, often with a secondary loss of labialization) caused, apparently, several other types of correspondences as well of PNC _*w_ in PIE:

a) Metathesis of labialization (PIE dipthongs with _-u-_), cf. examples 3.11 (_*bĭInḳḳwV_ : _*peuk̂-_), 3.13 (_*p̄ŏnqqIwe_ : _*bhā(u)ĝo-_), 5.9 (_*q̇q̇wīIq̇q̇a_ : _*keuk-_), 5.15 (_*renχ̱wV_ : _*reugh-_);

b) Clusters of velar consonants with _*w_ reflected as PIE labiovelars, cf. examples 1.9 (_*GG(w)V̄IṗV_ : _*g^{w}ēb(h)-_), 2.2 (_*lăHăḳwV_ : _*li̯ek^w-_), 2.7 (_*qqwata_ : _*g^{w}et-_), 2.11 (_*χ̱winḳwV_ : _*k^{w}enk^{w}e_ > _*penk^{w}e_), 3.8 (_*χwīrk(w)V_ : _*k^{w}erk^{w}o-_ > _*perk^{w}o-_), 3.23 (_*ˀəlmqqwV_ : _*(H)enk^w-_), 4.1 (PWC _*ǵ^{w}aš^{w}V_ : _*ag^w(e)sī_), 4.9 (_*ḳwărV_ : _*k^{w}er-_), 4.10 (_*χ̱IwĕrV_ : _*g^{w}erən-_), 4.17 (PWC _*g^{w}ərə_ : _*g^{w}eru-_);

c) Full loss of labialization. This phenomenon is observed after labial consonants (it should be noted that in such cases the reconstruction of _*w_ in PNC as well appears fairly hypothetical), cf. example 3.9 (_*pwīIłV_ : _*pel-_); fairly often after apical and lateral consonants, cf. examples 1.7 (_*wālrƛ̣ƛ̣w_ : _*pork̂o-_), 1.8 (_*ʡīIc̣wɨlV_ : _*ster-_), 1.10 (_*p̄Vš́wV_ : _*p(e)is-k-_), 2.13 (_*c̄wăjmi_ : _*saim-_), 2.14 (_*ʒ́wĕmV_ : _*stomen-_), 2.15 (_*ʒwilerʒwV_ : _*s/p/elĝh-en-_), 2.17 (_*ˀərəc̄wV_ : _*orso-_), 3.3 (_*c̣wēKV_ : _*k̂ēko-_), 3.15 (_*nə̄Hāc̣c̣wV_ : _*nedo-_), 3.17 (_*λwint̄V_ :

lento-*), 3.18 (λ̱wĭnˀɨ* : **lĭ̄no-*), 3.20 (**ˀăǯwV* : **(H)aiĝ-*), 4.1 (PWC **ǵʷašwV* : **agʷ(e)sī*), 5.7 (**maśwV* : **mizdho-*). However, cases of the loss of labialization after back consonants as well are not infrequent, cf. examples 2.4 (**kwVśV* : **ka(i)s-*), 2.6 (**ḳwVnV* : **konə-mo-*), 3.12 (**wēIrqwɨ* : **bherəĝ-*), 5.4 (**mŏrqqwV* : **mar(o)ĝ-*).

4. By analogy with other local series (see below) we would expect that PIE voiceless **p* should correspond to PNC ejective *ṗ*. However, in the sole example (1.9 **GG(w)V̄IṗV* : **gʷēb(h)-*) we have **b(h)*. It should be noted that in PNC **ṗ* is an exclusively rare phoneme with not very clear-cut reflexes; we do not exclude that in this case it is necessary to reconstruct PEC **p̄* (cf. the PL form **qoIp̄*), but to consider glottalization in PN secondary. In any case, on the basis of only one example it is difficult to reach conclusions of any sort.

An examination of the correspondences of consonants in the labial series already leads us to the conclusion that the isoglosses examined above are the result of borrowings from PNC (or from some source very close to PNC) into PIE. In reality, the development of **bh* > *p* in the cases of the type **porḱo-* should have taken place already on Indo-European soil; had the direction of the borrowings been from PIE into PNC this development would be completely incomprehensible, because in the place of a single PIE **p* we have in PNC four reflexes (**p*, **p̄*, **b* and **w*). For exactly this reason it is easy to explain the loss of the labial articulation in the series of consonant clusters when the borrowing is from PNC to PIE, but it would be difficult to explain its secondary appearance in PNC in the instance of reception via the opposite direction of borrowing. The identical reflex in PIE of the PNC phonemes **b* and **w* is easy to explain, knowing that **w* in PNC in an independent position was pronounced, most probably, as a labio-dental *β* (cf. the development of **w* > *b* in the majority of the daughter languages), but it would be significantly more difficult to interpret the appearance of the three reflexes (**p̄*, **b*, and **w*) in PNC in the place of the one and only initial **bh* in PIE, given an assumption that borrowing was from PIE into PNC. The remaining correspondences (see below) in effect seem as well to support the conclusion that borrowing was into PIE.

1.2 Dental consonants (occlusives and sonorants).

In PNC four dental stops are reconstructed: voiceless (aspirated) _*t_, tense (unaspirated) _*t̄_, voiced _*d_ and ejective _*ṭ_, and three sonorants (_*n_, _*r_ and _*j_).

The correspondences between PNC and PIE are worked out as follows:

PNC	PIE	Examples
*t	*t	2.7 (_*qqwata_ : _*g^{w}et-_), 5.12 (_*ʔV-twVr-_ : _*tu̯er-_)
*t̄	*d-, *-t-	1.5 (_*t̄Vq̇V_ : _*dik-_), 3.17 (_*λwint̄V_ : _*lento-_), 4.4 (_*bVrVt̄V_ : _*pert(h)-_)
*d	*d	3.6 (_*qüIr-dV_ with suffixal _*-dV_, see above — PIE _*ĝherd-_)
*ṭ	?	(no examples)
*n	*n	2.1 (_*hāInqqV_ : _*(H)ang-_), 2.3 (_*ƛ̱wāhnɨ_ : _*Huələnā_), 2.6 (_*ḳwVnV_ : _*konə-mo-_), 2.8 (_*ç̣ç̣ănV_ : _*ĝ(h)enu-_), 2.11 (_*χ̱winḳwV_ : _*k^{w}enk^{w}e_), 3.15 (_*nə̄Hə̄ç̣ç̣wV_ : _*nedo-_), 3.17 (_*λwint̄V_ : _*lento-_), 3.18 (_*λ̱wĭnʔɨ_ : _*lĭ̄no-_), 4.2 (_*ʕŏnç̣ç̣V_ : _*(H)anətā_), 4.5 (_*nićV_ : _*n̥si-_)
*r	*r	1.7 (_*wāIrƛ̣ƛ̣w_ : _*pork̂o-_), 2.10 (_*pwərccV_ : _*pērs-nā_), 2.16 (_*kɨ̆r(w)V_ : _*kēr-_), 2.17 (_*ʔərəc̄wV_ : _*orso-_), 3.4 (_*kkärmuśV_ : _*kermus-_), 3.6 (_*qǖIrV_ : _*ĝherd-_), 3.8 (_*χ̱wɨ̄rk(w)V_ : _*k^{w}erk^{w}o-_), 3.12 (_*wēIrqwɨ_ : _*bherəĝ-_), 3.14 (_*bVrč̣-_ : _*bhar(e)s-_), 3.16 (_*rəƛ̱ƛ̱V_ : _*rughi̯o-_), 4.3 (_*HaʒʒārV_ : _*(H)edhro-_), 4.4 (_*bVrVt̄V_ : _*pert(h)-_), 4.9 (_*ḳwărV_ : _*k^{w}er-_), 4.10 (_*χ̱IwĕrV_ : _*g^{w}erən-_), 4.15 (PWC _*g^{w}ərə_ : _*g^{w}eru-_), 5.1 (_*ʔār(H)V_ : _*ārHo-_), 5.2 (_*ʕüç̣ḉ̣ürV_ : _*(H)aĝro-_), 5.4 (_*mŏrqqwV_ : _*mar(o)ĝ-_), 5.5 (_*ʔŏIrVc(w)e_ : _*(H)areĝ-_), 5.8 (_*ḳĕrḳĕlV_ : _*k̂orkā-_), 5.12 (_*ʔV-twVr-_ : _*tu̯er-_), 5.13 (PWC _*pərəɣə_ : _*pr̥k-_), 5.15 (_*renχ̱wV_ : _*reugh-_), 5.16 (_*š:wĭrV_ : _*su̯er-_ / _*sūr-_)
*j	*i̯ / *Ø	1.1 (_*Hējʒú_ : _*(H)aiĝ-_), 2.13 (_*c̄wă̄jmi_ : _*saim-_), 3.21 (_*ʔăjʒăłhV_ : _*(H)edhl-_), 5.6 (_*u̯VjcV_ : _*u̯es(-no-)_), 5.10 (_*ccōjwɨłħV_ : _*k̂i̯āu̯ero-_)

REMARKS

1. The reflex of _*t̄_ in PIE is reminiscent of the reflexes in several of the present-day Dagestanian languages of the Archi type, where _*t̄_ is reflected as voiced _d-_ initially, but as _-t̄-_ medially.

2. The sonorant _*n_ in medial combinations sometimes drops out in PIE. This occurs:

a) before apical affricants, cf. examples 1.2 (_*ħīnčwV_ : _*ek̂u̯o-_), 3.10 (_*pinç̣ç̣wV_ : _*pĭ̄tu-_). The preservation of _*n_ in example 4.2 (_*ʕonç̣ç̣V_ : _*(H)anətā_) is explained, apparently, by an early epenthetic vowel between _n_ and _ç̣ç̣_ in the source language (cf. for the three words observed here, for example, the following Avar words: _ču_ (< _*ˀiču_) 'horse', _piç̣_ 'resin', but _nuç̣a_ 'door', where the very same development is observed as that in PIE.) In this way, this peculiarity of the PIE reflexes, most probably, is explained by the particularities of the phonological system of the PNC dialect that served as the source of the borrowings;

b) in those cases when in PIE a metathesis of labialization took place (see above, under 1.1. Labial consonants, 3.a.), cf. examples 3.11 (_*bĭInḳḳwV_ : _*peuk̂-_), 3.13 (_*p̄ŏInqqwe_ : _*bhā(u)ĝo-_), 5.15 (_*renx̱wV_ : _*reugh-_). The preservation of _-n-_ in these cases would have led to the formation of phonetic structures inadmissible for PIE, combining two sonants in a non-syllabic function within a single syllable (_*peunk̂-_, _*bhaunĝo-_ and _*reungh-_). In that way this development, seemingly, took place already on Indo-European soil.

3. The sonant _*j_ is a fairly rare phoneme in PNC; for this reason we do not have any examples of its reflexes in the initial and intervocalic positions in PIE. In medial consonant combinations _*j_ is reconstructed only in a very limited number of cases, namely when in the root there are sibilants or palatal affricates, producing the PN reflex _*st_ (the development of *C, *Ć > PN _*st_ seemingly is complicated merely by its presence in a syllable that contains an affricate of the sonorant _*j_). Judging by the available examples, PIE reflects this _*j_ as _*i_ when followed by _*a_ (cf. examples 1.1, 2.13, 5.10), but it has a zero reflex after _*e_ (cf. examples 3, 21, 5.6, 5.10). In several cases PIE has diphthongs with _*i_ (or syllabic _*i_, possibly, this being a step in the reduction of original _*ei/*oi_), whereas in the PNC reconstruction there is an absence of the _*j_, cf. examples 2.4 (_*kwVśV_ : _*kais-_), 3.20 (_*ˀăǯwV_ : _*(H)aiĝ-_), 5.7 (_*maśwV_ : _*miz-dho-_ < _*meis-dho-_). It is very

likely that in these cases PNC had _-j-_, but the phonetic structure of these roots is such that with the presently available correspondences we simply are unable to reconstruct it.

4. PNC _*r_ in the absolute majority of cases (whether in an independent position or in combinations) is reflected in PIE as _*r_; see the many examples above. The unitary exception is the position before sibilant affricates (> PIE palatal velars, see below), where in the two cases known to us _*r_ is lost, cf. examples 1.11 (_*ç̣V̆rʒV_ : _*k̂ek̂-_), 2.15 (_*ʒwilerʒwV_ : _*s/p/elĝh-en_). A similar development is characteristic for many North Caucasian languages, and it is possible to think that it is conditioned by the particularity of the dialect of PNC that had served as the source of the borrowings.

As we see, the correspondences between PNC and PIE in the area of dental consonants also support the thesis of the direction of the borrowing being from PNC (or a dialect of PNC) into PIE.

In the opposite case we would be obliged to consider that 1) both PNC _*t_ and _*t̄_ can correspond to one and the same PIE medial _*t_; 2) notwithstanding the absence in PIE of a sonant in medial combinations, in borrowed lexemes in PNC the parasitical sonants _-n-_ and _-r_ -, though having no Indo-European source, can appear.

1.3. Velar consonants.

The velar series from the point of view of the PNC phonological system was affricate. The general peculiarity of all the PNC affricate series consisted of the fact that they incorporated within themselves besides plosive consonants spirants as well. In addition, each of the plosive consonants had a geminate correlate (from the phonological point of view similar geminates can be regarded either as combinations of two identical affricates or as combinations of affricate plus harmonic spirant).

For PNC four plosive velars (_*k_, _*k̄_, _*ḳ_, _*g_) and three velar spirants (_*x_, _*x̱_, _*γ_) are reconstructed. The reflexes of the PNC velar spirants in PIE are unknown (there are no examples). For the remaining velars the correspondences are worked out as follows:

PNC	PIE	Examples
*k	*k / *k^{w}	2.4 (_*kwVśV : *kais-_), 2.9 (_*c̣c̣ə̄kwV : *tu̯ak-_), 2.16 (_*kɨ̆r(w)V : *kēr-_), 3.3 (_*c̣wēkV : *k̂ēko-_), 3.8 (_*χ̱wɨ̄rk(w)V : *k^{w}erk^{w}o-_), 4.14 (_*həlkwV : *H^{w}erk-_)
*k̄	*ĝ(h) / *g(h)	3.5 (_*k̄ălVk̄V : *ĝholg(h)-_)
*g	*ĝ / *g^{w}	3.1 (_*HVbVgV : *(H)au̯iĝ-_), 4.1 (PWC _*ǵ^{w}aš^{w}V : *ag^{w}(e)sī_), 4.15 (PWC _*g^{w}ərə : *g^{w}eru-_)
*ḳ	*k / *ḳ / *k^{w}	2.6 (_*ḳwVnV : *konə-mo-_), 2.11 (_*χ̱winḳwV : *k^{w}enk^{w}e_), 4.8 (_*ḳuƚe : *klāu̯-_), 4.9 (_*ḳwărV : *k^{w}er-_), 5.8 (_*ḳĕrḳĕlV : *k̂orkā-lā_)
*kk	*k/*k̂	3.4 (_*kkärmuśV : *kermus/*k̂-_)
*k̄k̄	?	(no examples; cf., though, 3.5 _*k̄alVk̄V : *ĝholg(h)-_, where in PEC also possible is the reconstructed form _*k̄k̄_)
*gg	*gh	2.12 (_*p̄üggV : *bhāĝhu-_)
*ḳḳ	*k̂	3.11 (_*bĭInḳḳwV : *peuk̂-_)

REMARKS

1. The distribution of voiced and voiced aspirate correspondences for PNC _*k̄_ and _*g_ is not totally hopeful: in the first examples, where PNC _*g_ is presented, in actualfact the reconstruction _*k̄_ is also possible (the reflexes of _*k̄_ and _*g_ are opposed best of all in the Lak and Dargi languages, the data of which for the roots discussed above are not available).

2. Besides example 2.12, the PNC geminate _*gg_ is represented, apparently, also in example 5.13 (PWC _*pərəγə : *p̥r̥k-_), where PWC _*γ_ goes back to to PNC _*gg_. In PIE we have here
voiceless _*k_ in place of the expected _*gh_ as a result of the particular Indo-European rule of the inadmissibility in a root of a voiced or voiced aspirate consonant, so that _*p̥r̥k- < *p̥r̥gh-_ (cf. 1.1, remark 1).

3. On the possibility of the presence in PIE of a labiovelar in the position in PNC of the combination "velar + _w_" see above, 1.1., remark 3, a). As for Indo-European palatals, they seemingly correspond to PNC velars if the latter were located before a front vowel plus PNC _*a_ (cf. examples 3.5, 5.8); oppositely, before a back vowel PNC velars are reflected in PIE as non-palatalized (cf. examples 2.17, 4.8). Palatalization is absent as well in the presence in PNC of the glide _*w_ (cf. the examples above).

With the velar consonants, the falling together in PIE of the reflexes of voiceless (aspirate) and ejective velars in a single voiceless _*k_ provides evidence of the direction of borrowing, from PNC into PIE (in the opposite case the motivationless appearance of two series of consonants in PNC in the position of one in PIE would be incomprehensible.)

1.4. Uvular consonants.

In PNC four uvular affricates (_*q_, _*q̱_, _*G_, _*q̇_), with geminate correlates, and three uvular spirants (_*χ_, _*χ̱_, _*ʁ_) are reconstructed. All the uvular consonants are reflected in PIE as velars, with the following correspondences:

PNC	PIE	Examples
*q	*g/*ĝ	3.2 (_*ˀĕqV_ : _*(H)āg-_), 3.12 (_*wēIrqwɨ_ : _*bherəĝ-_)
*q̱	?	(no examples)
*G	?	(no examples)
*q̇	*k	1.3 (_*q̇ŏIcV_ : _*kaĝo-_), 1.4 (_*q̇VIV_ : _*kol-_), 1.5 (_*ł̄Vq̇V_ : _*dik-_), 2.5 (_*q̇ămq̇ə_ : _*kenk-_)
*qq	*g(h) / *ĝ / *g^{w}	2.7 (_*qqwata_ : _*g^{w}et-_), 3.13 (_*p̄ŏInqqwe_ : _*bhā(u)ĝo-_), 5.4 (_*mŏrqqwV_ : _*mar(o)ĝ-_), 5.17 (_*łimqqIV_ : _*lengh-_)
*q̱q̱	*g(h)	2.1 (_*hāInqqV_ : _*(H)ang-_), 3.7 (_*qqĕlĕqqe_ : _*glōgh-_); an exception is 3.23 (_*ˀəImqqwV_ : _*(H)enk^{w}-_)
*GG	*g(^{w})	1.9 (_*GG(w)V̄Iṗ V_ : _*g^{w}ēb(h)-_)
*q̇q̇	*k/*k^{w}	5.9 (_*q̇q̇wīIq̇q̇a_ : _*keuk-_), 5.11 (_*čVIq̇q̇wV_ : _*k̂ek^{w}-_)
*χ	*k̂	4.6 (_*χamV_ : _*k̂om-_)
*χ̱	*gh/*g^{w}(h)	4.10 (_*χ̱IwĕrV_ : _*g^{w}erən-_), 5.15 (_*renχ̱wV_ : _*reugh-_)
*ʁ	?	(no examples)

REMARKS

1. The uvulars are reflected in total in PIE as are the velars as well, with the notable exception that voiceless aspirates give in PIE voiced reflexes (as also do their geminal correlates). We note that the voiced affricates in examples 3.6 (PIE _*ĝherd-_) and

3.7 (PIE **glŏgh-*) might be secondary as a result of the action of the particular Indo-European rule of the inadmissibility in a root of two voiced non-affricates.

2. The tense spirant **χ̱* is reflected in PIE as **g(^{w})* or **gh(^{w})* (the distinction between these two reflexes is so far unclear). In two cases the we observe the reflection of **χ̱* as **k(^{w})*, cf. examples 2.11 (**χ̱winḳwV* : **k^{w}enk^{w}e* > **penk^{w}e*) and 3.8 (**χ̱wīrk(w)V* : **k^{w}erk^{w}o-* > **perk^{w}o-*). In these cases clearly there should have been present the reflex **gh^{w}*, but devoicing occurred as a result of the action of the internal Indo-European rule of the inadmissibility of the combining in a roota voiced affricate and a voiceless consonant (for other cases of the action of this rule see 1.1, remark 1).

3. As for the reflexes in PIE of the uvular consonants, just as with the velars, simple or palatalized velars may appear. However, the positional distribution here is not so clear and requires additional research.

The very fact of the reflexes of PNC uvulars as PIE velars testifies, one would think, to the direction of borrowing being from PNC into PIE: in the opposite case things would be completely unclear, as one and the same Indo-European velar series would be reflected in North Caucasian sometimes as a velar series and sometimes as a uvular series (as we shall see below, other North Caucasian consonants as well may correspond to the Indo-European velars).

1.5. Lateral consonants.

In PNC four lateral afficates (**ƛ*, **ƛ̱*, **Ł*, **ƛ̣*), with geminate correlates, two spirants (**λ*, **λ̱*), and two sonorants (**l*, **ɫ*) are reconstructed.[24] The phonetic distinction between the latter two consonants is not fully clear (PNC **ɫ* in the daughter languages gives a single-form reflex, *l*, whereas **l* is reflected as *l* or *r*). The correspondences between PNC and PIE are fixed as follows:

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[24] These lateral affricates are sometimes written /tl, t̲l̲, dl, tl'/ respectively, though in some Caucasian languages such as Archi they have a velarized character, thus more like /kl, k̲l̲, gl, kl'/. They are unit phonemes, not clusters. The spirants are like the voiceless lateral spirant in Welsh /ll/, Navajo /ł/. [Ed.]

PNC	PIE	Examples
*ƛ	?	(no examples)
*ƛ̱	*l	2.3 (*ƛ̱wāhnɨ : *Huələnā)
*Ł	?	(no examples)
*ƛ̣	*k̂ / *kʷ	1.6 (*p̄äHäƛ̣wV : *pek̂u-), 2.2 (*läHäƛ̣wV : *li̯ekʷ-)
*ƛƛ	?	(no examples)
*ƛ̱ƛ̱	*gh	3.16 (*rəƛ̱ƛ̱V : *rugh-i̯o-)
*ŁŁ	?	(no examples)
*ƛ̣ƛ̣	*k̂	1.7 (*wālrƛ̣ƛ̣wə : *pork̂o-)
*λ	*l	3.17 (*λwint̄V : *lento-)
*λ̱	*l	3.18 (*λ̱wĭnˀɨ : *lī̆no-)
*l	*l/*r	1.4 (*q̇VlV : *kol(i)-), 2.2 (*läHäƛ̣wV : *li̯erʷ-), 2.15 (*ʒwilerʒwV : *s/p/elĝhen-), 3.7 (*qqĕlĕqqe : *glŏ̆gh-), 4.7 (*ç̣əwlɨ : *k̂ūl-), 4.14 (*həlkwV : *Hu̯erk-), 5.3 (*ʒʒəlHV : *dholo-), 1.8 (*ˀɨ̄lç̣wɨlV : *ster-), 5.10 (*ccōjwɨ̄lħV : *k̂i̯āu̯ero-)
*ł	*l	3.9 (*pwīlłV : pel-), 3.21 (*ˀăjʒăłħV : *(H)edhl-), 4.8 (*ḳułe : *klāu̯-), 4.12 (*č̣ɨwłu : *k̂seul-), 4.13 (*čalłe : *sel-), 5.17 (*łimqqIV : *lengh-)

REMARKS

1. The reflexes of the PNC laterals in PIE as velars are fully comprehensible from the articulatory aspect if the peculiarities of articulation of the laterals in PNC are taken into account: phonetically these were, apparently, lateralized velars, which led to a development from laterals to velars in many daughter languages. Several lateral affricates, however, are reflected in PIE as *l; in all the cases known to us PIE has *l in place of PNC lateral spirants.

2. PNC *ł always is reflected in PIE as *l; as for PNC *l, it may give either *l or*r. The distribution between these two reflexes is the following:

a) PNC *l is reflected as*r in medial consonant clusters (cf. example 4.14);

b) at the end of a root *l can be reflected as *r or *l, apparently depending upon the preceding vowel. Cf. examples 1.8 (PIE *ster-), 5.10 (PIE *k̂i̯āu̯ero-), where before *r stands *e, in contrast to examples 1.4 (PIE *kol(i)-), 4.7 (PIE *k̂ūl-), 5.3 (PIE *dholo-);

c) in all the remaining cases *l is reflected as *l, cf. examples 2.2, 2.15, 3.55, 3.7.

We note here also that the hypothesized borrowing from PNC would not explain the reason for the reflection of Indo-European velars but Caucasian laterals (given the presence in PNC of a particular velar series).

The development of **l* > **r* (in the positions indicated above), apparently, was peculiar to the particular dialect of PNC which served as the source of the borrowings, such that explaining it on Indo-European soil itself is not possible; we emphasize once again that the transition of **l* > **r* is characteristic for the history of many present-day North Caucasian languages (and in particular for the West Dagestanian).

1.6. Sibilant lamino-alveolar consonants.[25]

For PIE, as is known, one lamino-alveolar consonant is reconstructed—**s* (with a voiced variant *z before voiced consonants). In contrast, for PNC four lamino-alveolar affricates are reconstructed (**c*, **c̄*, **ʒ*, **c̣*), together with geminated correlates, and three lamino-alveolar spirants (**s*, **s̄*, **z*).

Any correlation in PIE to the rare PNC **z* (as also to the other voiced spirants), as well as to PNC **s̄*, is unknown. The lamino-alveolar sibilant spirant **s* is reflected in PIE as **s* in example 3.16 (**sūsV* : **sasi̯o-*). The lamino-alveolar affricates also are occasionally reflected in PIE as **s*, cf. examples 5.6 (**u̯VjcV* : **u̯es(no-)*; here, however, only a Kartvelian borrowing points to the affricate: see above; relying on North Caucasian data proper the reconstruction **s̄* is also possible): 2.10 (**pwərccV* : **pērs-nā*); in two cases PNC tense **c̄* is reflected as **s*, cf. examples 2.13 (**c̄wăjmi* : **saim-*), 2.17 (**ˀərəc̄wV* : **orso-*). However, in the overwhelming majority of cases PIE reflects the PNC lamino-alveolar sibilants as palatals (the only local series whose PIE articulation could approximate the affricate, as is visible from the reflexes in the "Satem" languages), or as dental stops. Cf. the correspondences:

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[25] PNC had three series of sibilants and sibilant affricates, for which Starostin used the terms "hissing" (or "whistling"), "hushing", and the intermediate "hissing-hushing" (or "whistling-hushing"). Here we have substituted the more usual terms "lamino-alveolar," "palato-alveolar," and "apico-alveolar" respectively. A similar tripartition is found in Basque (/s/ - /š/ - /ś/, with corresponding affricates) and Burushaski (/s/ - /ṣ/ - /ś/, with corresponding affricates), thus the triple sibilant contrast seems to be an original Dene-Caucasian feature. [Ed.]

PNC	PIE	Examples
*c	*ĝ	1.3 (**q̇ŏIcV* : **kaĝo-*), 5.5 (**ʔŏIrVc(w)e* : **(H)areĝ-*)
*ʒ	a) *ĝh	1.11 (**c̣V̆rʒV* : **k̂ek̂- / *ĝeĝh-*), 2.15 (**ʒwilerʒwV* : **s/p/elĝh-*)
	b) *dh	3.21 (**ʔăjʒałħV* : **(H)edhl-*)
*c̣	*k̂	1.11 (**c̣V̆rʒV* : **k̂ek̂- / *ĝeĝh-*), 3.3 (**c̣wēKV* : **k̂ēko-*)
*cc	*k̂	5.10 (**ccōjwīłħV* : **k̂i̯au̯ero-*)
*c̄c̄	?	(no examples)
*ʒʒ	*dh	4.3 (**Haʒʒārv* : **(H)edhro-*), 5.3 (**ʒʒəlHV* : **dholo-*), 5.14 (**hwĭmiʒʒu* : **medhu-*)
*c̣c̣	*t/*d	2.9 (**c̣c̣əkwV* : **tu̯ak-*), 3.10 (**pinc̣c̣wV* : **pĭtu-*), 4.2 (**ʕonc̣c̣V* : **(H)anətā*), 3.15 (**nəHəc̣c̣wV* : **nedo-*)

REMARKS

1. From the table it can be seen that the PNC lamino-alveolar geminates usually transfer to Inod-European as dental stops, whereas the PNC non-geminate lamino-alveolar sibilants transfer as palatals (although there are exceptions to this rule, cf. the transfer of **cc* as **k̂*, and also the double transfer of **ʒ* as **ĝh* or as **dh*)[26].

2. PNC **c̣V̆rʒV* 'weasel' should have corresponded to PIE **k̂eĝh-*; the combination of voiceless and voiced aspirate consonants in one root, however, was inadmissible, and the variants **k̂ek̂-/*ĝeĝh-* are explained by the tendency to eliminate this combination.

3. Absolutely unique is the reflex of the initial combination**ʒw-* in example 2.15 (PIE **s/p/elĝh-en-* 'spleen'). We note that this root gives irregular reflexes in the Indo-European languages; not to be ruled out is that a special initial combination of the type **sb-* should be established in it (cf. the Baltic reflex with voiced *b-*), having arisen as a result of an attempt to transfer PNC **ʒw-*.

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[26] Interesting here is the presence in PIE, side-by-side with **pĭtu-* (= PNC **pinc̣c̣wV*), of the root **pik̂*, reflected in Greek πίσσα, Lat. *pix* 'resin, pitch', *picea* 'pine', *pīnus* (**pik-sno-*) 'pine, fir, silver fir'; possible also is Alb. *pišë* (**pik̂-si̯ā*) 'fir, spruce, resinous tree' (the Latin forms are in the final analysis the source of the Slavic, Baltic and Germanic names for resin [*WP*: II, 75; Vasmer: III, 226, with references]). Not to be ruled out is the possibility that we have before us as well a case of a double transfer of the PNC sibilant **c̣c̣*, which has led to the formation of an etymological doublet in PIE.

1.7. Sibilant palato-alveolar consonants.

In PNC four palato-alveolar affricates (**č, *č̄, *ǯ, *č*), with geminate correlates, and three palato-alveolar spirants (**š, *š:, *ž*) are reconstructed. Also often cited as a reflex of the palato-alveolar sibilants is PIE **s*: cf. for the spirants examples 4.1 (PWC **ǵʷašʷV* : PIE **agʷ(e)sī*; in this root, however, an affricate also could have been the original, see below), and 5.16 (**š:wĭrV* : **su̯er-/*sūr-*). For the affricates cf. 4.13 (**čalłe* : **sel-*), 3.14 (**bVrčinV* : **bhar(e)s-*). In one case (4.12, * *ɨwłu* : **k̂seul-*) the specific reflex **č* in the form of PIE **k̂s-* is observed—obviously an attempt to transfer the double-focus articulation of the PNC consonant. In the majority of the cases, however, the palato-alveolar affricates are transferred into PIE as palatalized velars (that is, similar to the sibilant spirants). Cf.:

PNC	PIE	Examples
*č	*k̂	1.2 (**ħɨ̄nčwV* : **ek̂u̯o-*), 5.11 (**čVIq̇q̇wV* : **k̂ekʷ-*)
*č̄	?	(no examples)
*č̣	*k̂s	4.12 (**č̣ɨwłu* : **k̂seul-*)
*ǯ	*ĝ	3.20 (**ʔăǯwV* : **(H)aiĝ-*)
*čč	?	(no examples)
*č̄č̄	?	(no examplesf)
*č̣č̣	*ĝ	2.8 (**č̣č̣ănV* : **ĝ(h)enu-*)
*ǯǯ	?	(no examples)

REMARKS

1. In example 2.8 (PNC **č̣(č̣)ănV*—PIE **ĝ(h)enu-*) PNC **č̣(č̣)ănV* can be reconstructed as **č̣* or as **č̣č̣* (decisive data for the Avaro-Andi languages are missing). Judging by the Indo-European reflex, however, **č̣č̣* is to be preferred (cf. below on the analogous reflex of geminate **ć̣č́*).

2. Let us note that even given this general similarity the North Caucasian palato-alveolar sibilants are nevertheless reflected in PIE not entirely as one would expect palato-alveolar sibilants to behave: cf. the voiceless reflex **č* > **k̂* as against voiced **ǯ* > **ĝ*; and the special development **č̣* > **k̂s* (as against **c̣* > **k̂*). It is also characteristic that we have not come upon a single case of a reflex of PNC sibilants involving dental stops (see above).

1.8. Apico-alveolar sibilant consonants.

In PNC yet a third series of apical affricates is reconstructed, of which their common peculiarity is that in the Dargi and Nakh languages they yield lamino-alveolar reflexes whereas in the remaining East Caucasian languages they yield palato-alveolar reflexes (in West Caucasian some of the affricates of this third series yield lamino-alveolar while some yield palato-alveolar reflexes). Also reconstructed is a third series of apical spirants displaying a vacillation between lamino-alveolar and palato-alveolar language by language. To these phonemes we conditionally assign the characteristic of palatalization (although in actuality this could well be some other characteristic, making for an intermediate position of this series between lamino-alveolars and palato-alveolars). As in the other affricate series, four lapico-alveolar affricates are reconstructed (**ć, *ć̱, *ʒ́, *ć̣*), with geminate correlates, and three apico-alveolar spirants (**ś, *ś:, *ź*).

The lapico-alveolar spirants (except **ź*, for the reflexes of which there are no examples) regularly yield **s* in PIE, cf. examples 2.4 (**kwVśV* : **kais-*), 3.4 (**kkärmuśV* : **kermus*), 5.7 (**maśwV* : **miz-dho /< *mis-/*), 1.10 (**p̄Vś:wV* : **p(e)is-k-*).

For the remaining apico-alveolars the following reflexes are attested:

PNC	PIE	Examples
*ć	*s	3.22 (**ʕälmćə* : **amas-l-*), 4.5 (**nićV* : **n̥si*)
*ć̱	?	(no examples)
*ʒ́	*ĝ	1.1 (**Hējʒ́u* : **(H)aiĝ-*)
*ć̣	*k̂	4.7 (**ć̣əwlɨ* : **k̂ūl-*)
*ćć, *ć̱ć̱, *ʒ́ʒ́	?	(for all these geminates there are no examples)
*ć̣ć̣	*ĝ	5.2 (**ʕüć̣ć̣ürV* : **(H)aĝro-*)

Although there are not very many examples, it is nevertheless apparent that the PNC apico-alveolar consonants are reflected in PIE in the same manner as the palato-alveolar consonants (see above). An exception is the development of **ć̣* > **k̂* (in contrast specifically to the transfer of **ç̌* > **k̂s*), as well as two cases where in place of PNC apico-alveolar affricates PIE has the combination **st* (cf. examples 1.8 (**ʡīlçwɨlV* : **ster-*, 2.14 (**ʒ́wĕmV* : **stomen-*). Even so, these cases enable us to presume that in the PNC dialect which served as the source of the borrowings the lapico-alveolar and the palato-alveolar series were distinct from each other.

1.9. Laryngeal consonants.

For PIE only one laryngeal consonant is solidly reconstructed—**H*, reflected as *ḫ* in Hittite and giving a null reflex in the remaing Indo-European languages. By contrast, for PNC an entire series of laryngeals is reconstructed, consisting of two simple (*ˀ, **h*) and three emphatic (**ʡ*, **ħ*, *ˤ) laryngeals (the emphatic laryngeals are also often called pharyngeals).

In view of the peculiarities of the reflexes of the laryngeals in the Indo-European languages material for the verification of the correspondences between PNC and PIE is limited to the roots whose reflexes are represented in Anatolian. Roots with medial and final laryngeals in this case were not found (in the sole case where Hittite shows a medial laryngeal—5.1, PNC **ˀār(H)V*—PIE **ārHo-*, Hitt. *arḫa-*—the available North Caucasian material, unfortunately, not only does not enable us to determine the quality of the PNC laryngeal, but not even to settle the question of whether it existed in that position in general). As for the final position, the following correspondences are revealed:

PNC	PIE	Examples
*ˀ	*Ø	2.17 (**ˀərəčwV* : **orso-*), 5.1 (**ˀār(H)V* : **ārHo-*)
*h	*H	2.3 (**ƛ̱wāhnɨ* : **Huələnā*; here for PNC it is necessary to presume a secondary metathesis of **H* from medial to initial), 4.14 (**həlkwV* : **Hu̯erk-*)
*ʡ	?	(no examples)
*ħ, *ˤ	Ø	1.2 (**ħīnčwV* : *ek̂u̯o-*), 3.22 (**ˤälmćə* : **amas-l-*)

REMARKS

1. The rule of the correspondence of PNC *ˀ : PIE *Ø seemingly contradicts example 5.5
(**ˀoIrVc(w)e* : **(H)areĝ-*). However, as we remarked above, it is not ruled out that the PIE roots with the meaning 'light, radiant' and 'silver' drew together secondarily, as a resulte of folk etymology. In Anatolian this root is attested only with the meaning 'light, white', while the meaning 'silver' is absent. Therefore in actual fact the root **(H)areĝ-* 'silver' in PIE could well not have had an initial laryngeal.

2. In two cases—1.8 (**ʡɨ̄Ić̣wɨlV* : **ster-*) and 5.14 (**hwĭmĭʒʒu* : **medhu-*)—in PIE correspondence is absent for the entire syllable with an initial laryngeal. This phenomenon, probably, is conditioned by a reduction of the vowel of the first syllable in a tri-syllabic structure (we note that in both cases the vowel is weak, easily amenable to reduction; in cases where, given the same root structure, the initial vowel is strong PIE usually preserves it, cf. examples 2.17, 3.21, 4.3).

2. SYSTEM OF VOCALISM

The vowel system reconstructed for PNC is richer than the common Indo-European system. It consists of nine vowels (**i, *e, *ä, *ɨ, *ə, *a, *u, *o, *ü*), each of which can be long or short (the opposition according to length has been preserved best of all in the Nakh languages, but it is obliquely reflected in the other East Caucasian languages as well)[27]. Moreover, also reconstructed are pharyngealized vowels (although the latter may in the final analysis go back to constructions of the type 'vowel + laryngeal'). Apparently, in PNC there existed as well vocalic ablaut, but as of now a system of vowel gradation has not been reconstructed (for which reason reconstruction of the verbal vocalism has been greatly impeded).

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[27] The system of vocalism completely disintegrated in PWC, where it was reduced to a total of two vowels (**a* and **ə*); there are, however, many arguments that namely the East Caucasian system is the original one, but that in PWC it underwent a modification on account of a transfer of the timbre oppositions of the vowels onto the neighboring consonants (as a result of which there arose an extraordinarily complex system of consonants with overlying, one upon the other, correlations in accordance with labialization and palatalization).

The Indo-European vowel system clearly represents the result of an extended period of
earlier development (it underwent very substantial changes, judging from a comparison with the original Nostratic system of vocalism, on which see OCNYa). In part, vowel ablaut alternations were imposed onto the old vocalic system, which in many cases greatly complicate reconstruction of the original vocal characteristic of a root.

As a result of all that has been shown above the restoration of correspondences between PNC and PIE is made extraordinarily difficult. Nonetheless it is still possible to establish definitive regularities.

2.1. Initial (Anlaut) vocalism.

First of all we must note that efforts to discover correspondences in PIE to such PNC characteristics of vocalism as pharygelization and length-shortness have been unsuccessful. The pharyngealized vowels seemingly are reflected exactly the same as the corresponding non- pharyngealized vowels. Long PNC vowels can be reflected in PIE as long or as short, and the other way round — short vowels also may give either type of reflex. In connection with this it is not out of place to recall that length in PIE, according to several hypotheses, appears to be a relatively late phenomenon. It is possible, therefore, that in the period of PNC-PIE contacts long vowels did not yet exist, that they arose later, already completely independently of the length/shortness of the vowels in the corresponding PNC roots. Also possible, however, is a different explanation for the situation we observe, if one presupposes that the opposition of the vowels in PNC, which we interpret as an opposition according to length-shortness, had some other sort of phonetic essence (for example, this could be an opposition of types of phonation); in such case the absence of a reflection of this opposition in PIE would be natural.

As for the correspondences of qualitative characteristics of the vowels, they appear in
the following form:

	PIE	Examples
*i	*i	3.10, 3.18
	*e	2.11, 2.15, 3.9, 3.11, 5.14, 5.16, 5.17
*e	*e	3.3, 3.12, 4.10, 5.15
	*a	1.1 (5.5)
*ä	*a	2.13, 3.22
	*e	1.6, 2.2, 3.4
*ɨ	*e	1.2, 1.8, 2.16, 3.8, 4.12
*u	*u	3.4
*o	*a	1.3, 3.13, 4.2, 5.4
*ü	*a	2.12, 5.2
*a	*a	2.1, 3.20, 4.11, 5.1
	*e/*o	1.7, 2.5, 2.8, 3.5, 3.21, 4.3, 4.6, 4.9, 4.13

REMARKS

1. Indo-European in general, as is known, avoided combinations of two sonants, one following the other, within a single root morpheme. A frequent incidence of this rule was the elimination of the high vowels _*i_ and _*u_ before a following sonant (from the phonological point of view, in PIE _*i_ and _*u_ within a syllable are functionally the sonants _*i̯_ and _*u̯_). This rule, apparently, explains the presence of _*e_ in the position of PNC _*i_ in the majority of the cases (cf. 2.12 _*penk^{w}e_, 2.15 _*s/p/elĝh-en-_, 3.9 _*pel-_, 3.11 _*peuk̂-_, 5.16 _*s^{w}er-_ , 5.17 _*lengh-_). It is possible that this same cause led to the restructuring of the root in example 4.8 (PIE _*klāu̯-_ / _*klēu̯-_ vis-à-vis PNC _*ḳuƚe_). In those cases where after a high vowel there follows a "noisy"[28] consonant, the quality of the vowel is preserved (cf. 3.10 _*pī̆tu-_, 3.4 _*kermus-_). Exceptions to the formulated rules are few: these are 3.18 _*lī̆no-_ (with _*i_ in place of the expected _*e_) and 5.14 _*medhu-_ (with _*e_ in place of the expected _*i_). An unclear case is in ex. 3.19 (_*sasi̯o-_ in place of the expected _*susi̯o-_).

2. In the table it is clear that the PNC vowels _*e, *ä_ and _*a_ are reflected in PIE identically: namely, they give:

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[28] Russian шумный [Ed.].

a) _*a_ in initial position (that is, after a beginning laryngeal), cf. 1.1 (_*(H)aiĝ-_), 2.1 (_*(H)ang-_), 3.2 (_*(H)āg-_), 3.20 (_*(H)aiĝ-_), 3.22 (_*amas-l-_), 5.1 (_*ār(H)o-_), 5.5 (_*(H)areĝ-_). An exception to this rule is the reflex _*e_ in two 'tri-syllabic' structures (3.21 PNC _*ʔăjʒăłħV_ : PIE _*(H)edhl-_; 4.3 PNC _*HaʒʒārV_ : PIE _*(H)edhro-_), which, apparently, is explained by a reduction of the vowel in this position (cf. above on vowel reduction leading all the way to the loss in this particular position of the high PNC vowels _*ɨ_, _*i_).

b) _*e_ (sometimes with the ablaut variant _*o_) in all of the remaining cases, cf. 1.6 (_*pek̂u-_), 1.7 (_*pork̂o-_), 2.2 (_*li̯ek^{w}-_), 2.6 (_*kenk-_), 2.8 (_*ĝ(h)enu-_), 3.3 (_*k̂ēko-_), 3.4 (_*kermus-_), 4.7 (_*k̂om-_), 4.11 (_*k^{w}er-_), 4.12 (_*g^{w}erən-_) , 4.15 (_*sel-_), 5.8 (_*k̂orkā(-lā-)_), 5.15 (_*reugh-_). The exception: 2.13 (_*saim-_).

3. The specific PNC vowel _*ü_ in two cases is reflected in PIE as _*a_, cf. 2.12 (_*bhāĝhu-_), 5.2 (_*(H)aĝro-_) and in one case as having developed as _*ü > e_, cf. 3.6 (_*ĝherd-_). We note that the reconstruction of _*ü_ is based only on systemic considerations (in not one of the daughter languages is the reflex _ü_ actually represented) and, possibly, is incorrect.

4. PIE _*a_ likewise regularly appears as the reflex of PNC _*o_, cf. 1.3 (_*kaĝo- ~ -o-_), 3.13 (_*bhā(u)ĝo-_), 5.4 (_*mar(o)ĝ-_), 6.10 (_*k̂i̯āu̯ero-_).

5. The most varied correspondences are seen in PNC for PNC _*ə_, namely: 1) PIE _*a_, cf. 2.9 (_*tu̯ak-_); 2) PIE _*e_, cf. 3.15 (_*nedo-_), 3.23 (_*(H)enk^{w}-_); 3) PIE _*u_, cf. 3.16 (_*rughi̯o-_), 4.7 (_*k̂ūl-_); 4) PIE _*o_, cf. 5.3 (_*dholo-_), 2.17 (_*orso-_). It is obvious that PIE did not have an analog for the transfer of this vowel (PIE _*ə_ had a completely different phonetic character).

6. In a number of cases the Indo-European correspondences to PNC roots reveal a degree of reduction of the sonants; the qualitative oppositions of the vowels given this circumstance, naturally are neutralized. Such is the cases for 5.6 (_*n̥si-_), 6.14 (_*pr̥k-_); a degree of reduction may appear as well, naturally, in the reflexes of other roots in the capacity of an ablaut variant. Judging by everything, the degree of reduction of liquid nasals is a relatively late, peculiarly Indo-European development (just as was vowel length as well).

Similarly, the vowel system of the source language of the borrowings differed somewhat from the PNC system we have reconstructed. Thus it is possible that in it the vowels _*e_, _*ä_ and _*a_, having been distinct in PNC, had fallen together, and that the vowel

**o* had gone over to *a*; also that the hypothetical PNC **ü* had become some sort of *a*-form vowel. Also possible, however, are other interpretations of the situation we have here.

2.2. Final (Auslaut) vocalism.

So far it must be asserted that efforts to establish promising correspondences between PNC and PIE with regard to final vocalism have not been successful. This is explained in the first place by insufficiencies of reconstruction in both PNC as well as in PIE of final vocalism, which in their turn are conditioned by fully objective causes: for PNC there is an almost full reduction of final vowels in the majority of the contemporary languages, as a result of which the final vowels of the founding language must be reconstructed according to scattered, uncoordinated data from the Lak, Dargi and Avaro-Andi languages, together with a taking into account of what is known about Proto-Lezgi oblique bases. In sum the final vowels yield to restoration with greater or lesser promise only for a relatively small number of noun bases (for the verbs the situation is even worse). In Indo-European the final vowels underwent a sweeping morphologization: already on the PIE level the final vowels of noun bases are best regarded not as elements of the root but as morphological markers of a type of declension. As a result they are easily interchangeable, and to establish the original type of noun base (of the root) is frequently very difficult.

As for the correspondences between PNC and PIE, one can only point out that:

1) usually corresponding to PNC bases in **ɨ* are PIE bases in **o/ā*, cf. 2.3 **Hu̯ələnā*, 3.12 **bherəĝo-/-ā*, 3.18 **līno-*;

2) PIE bases in **-u* correspond either to PNC bases in *-u* or *-o*, cf. 5.14 *medhu-*, or to PNC bases with a final glide *ẉ*, cf. 1.6 *peḱu-*, 3.12 *pĭtu-*. Let us note, however, that the reverse is not true: PNC *u*-bases can correspond as well to other types of Indo-European bases, cf. 1.1 **(H)aiĝ-*, 5.12 **k̂seul(o)-*.

CONCLUSION

As a result of an examination of lexical isoglosses connecting the Indo-European and North Caucasian languages we must draw several important conclusions:

1. There is a large number of lexemes common to the reconstructed PNC and PIE entities.

2. Although between the PNC and PIE systems sufficiently regular phonetic correspondences can be established, the character of the shared vocabulary does not eliminate doubts that the common character of these lexemes is not the result of an original kinship but rather the result of borrowings. Characteristic is the presence among the lexical coincidences of words that are names of domestic animals and plants, terms connected with the raising of animals and the cultivation of plants (in part, the large number of names of body parts of animals), the many names of objects of everyday use, products for feeding, and trade-and- exchange relations. All of this indicates the active nature of the contacts between the Proto-North Caucasians and the Proto-Indo-Europeans. At that time the presence among the PNC-PIE isoglosses of a sufficiently large number of names of wild plants and vegetation as well as of terms for fauna such as 'frog', 'fish', and 'weasel' leads to the notion that we have before us evidence not simply of cultural contacts but of substrate relations.

3. A careful analysis of the phonetic correspondences enables us to come to the conclusion that the borrowing was done by the Proto-Indo-European side. Very many contrasts reconstructed for PNC are neutralized in the corresponding PIE lexemes, as is natural, in that PIE commanded a significantly poorer phonological system than PNC. In the case of a reverse direction of borrowings we would expect the formation within the PNC phonological system of a special, poorer subsystem typical for Indo-European borrowings (as this is observed, for example, in contemporary Caucasian languages when borrowing from Russian, or in the Korean, Japanese and Vietnamese languages when borrowing from Chinese). But here, to the contrary, it is clear that PIE assimilated PNC words into its system in the very most natural way —by means of the neutralization of phonological oppositions alien to it.

4. Analysis of the vocabulary provides grounds for several other important conclusions as well. In the first place, the contacts must have taken place prior to the disintegration of the common Indo-Europen unity. This is probable for the following reasons:

a) among the roots which were examined there is a sufficiently large number of them that have reflexes in Anatolian (and judging by everything we know, Proto-Anatolian broke away earliest of all from the remaining Indo-European dialects);

b) several phonological rules characteristic for PIE, apparently, were not yet in effect in the contacts we have examined. This relates first of all to the interdiction against combining within a single root morpheme voiced and voiceless aspirates, as well as two voiced consonants. In addition, it is possible that in the period of the PNC-PIE ties there did not yet exist oppositions of length (which, by the way, by all appearances are not reflected in Anatolian either—as the latest research shows [Ivanov 1982], Hittite *scriptiones plenae* reflect oppositions not of length but of accent.)

In the second place, the PNC dialect from which the borrowings were assimilated into PIE apparently already differed somewhat from the original common North Caucasian language. Analysis of the PNC-PIE isoglosses enables us to presuppose that in the source-language of the borrowings—

a) possibly the transition of **w-* > **b-* had already taken place (characteristic for a number of later systems);

b) in a number of cases there had taken place the loss of the sonorants **r* and **n* in medial (Inlaut) consonant combinations;

c) the transition **l* > **r* had taken place (at least at the beginning of initial consonant clusters, but also in a number of cases in the intervocalic position); possibly, the vowel system was transformed (the falling together of the vowels **e*, **ä*, **a* and the change of **o* > **a* took place).

A presupposition that the PIE linguistic unity was superimposed on a certain dialect of the PNC language would allow us to explain why in the original PNC system there is an absence of Indo-Europeanisms (in a case of balanced PNC-PIE contacts the presence of borrowings more or less equally on either side would be expected, in that there are no foundations for attributing to the Proto-North Caucasians a higher cultural level that to the Proto-Indo-Europeans).

5. Proceeding from all that has been said above, and also from what we know about the time of the disintegration of the PNC and PIE linguistic unities (for PIE, the period of about the fifth to fourth millennia BCE; for PNC, the boundary between the the sixth and fifth millennia BCE), we can date the contacts between PNC and PIE to the

beginning of the fifth millennium BCE, that is, to the epoch of a fully developed Neolithic in Western Asia (with which the presence of many characteristically Neolithic terms among the lexemes examined above also is in agreement). Of course, this dating is still approximate, and in order to make it more precise, as well as to propose a geographical localization of the PNC-PIE contacts, a great deal of work still will be required. In whatever case, we hope that the elaboration of the problems here will make a contribution to the overall task of the reconstruction of the linguistic and ethnic situation of the Neolithic of Western Asia and Europe.

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ABBREVIATIONS OF NAMES OF LANGUAGES AND DIALECTS

Abaz.	Abaza
Abkh.	Abkhaz
Ad.	Adygh
Adzh.	Adzhar dialect of Georgian
Afgh.	Afghan
Ag.	Agul
Ak.	Akushi dialect of Dargwa
Akht.	Akhty dialect of Lezgi
Akhv.	Akhvakh
Akk.	Akkadian

Alb.	Albanian
Alt.	Proto-Altaic
And.	Andi
Arab.	Arabic
Arak.	Arakul dialect of Lak
Arch.	Archi
Arm.	Armenian
Av.	Avar
Avest.	Avestan
Bagv.	Bagvalal
Balt.	(Proto-) Baltic
Bartkh.	Bartkhi dialect of Lak
Bezht.	Bezhta
Bret.	Breton
Btsb.	Bats(bi), Tsova Tush
Bud.	Budukh
Burshch.	Burshchag dialect of Agul
Bz.	Bzyb dialect of Abkhaz
Celt.	Celtic
Cham.	Chamalal
Chan.	Chan
Chech.	Chechen
Chir.	Chirag dialect of Dargwa
Darg.	Dargwa
Dyub.	Dyubek dialect of Tabasaran
Egyp.	Old Egyptian
Fit.	Fite dialect of Agul
Geg.	Geg dialect of Albanian
Gel'm.	Gelmets dialect of Tsaxur
Georg.	Georgian
Germ.	(Proto-) Germanic
Gk.	Old (Classical) Greek
God.	Godoberi
Goth.	Gothic

Hatt.	Hattic
Hier.-Hitt.	Hieroglyphic Hittite
Hin.	Hinukh
Hitt.	Hittite
Hunz.	Hunzib
Hurr.	Hurrian
Ing.	Ingush
Inkh.	Inkhokvar
Ir.	Irish
Iran.	Iranian
Ital.	Italian
Kab.	Kabardian
Kad.	Kadar dialect of Dargwa
Kait.	Kaitag dialect of Dargwa
Kar.	Karata
Kartv.	Kartvelian
Kharb.	Kharbuk dialect of Dargwa
Khin.	Khinalug Khv. Khvarshi
Khyur.	Khyürig dialect of Tabasaran
Kryz.	Kryts
Kub.	Kubach dialect of Dargwa
Kurd.	Kurdish
Lak.	Lak(i)
Lat.	Latin
Latv.	Latvian
Laz.	Laz
Lezg.	Lezgi
Lith.	Lithuanian
Megr.	Megrelian
MHGerm.	Middle High German
MIran.	Middle Iranian
MLGerm.	Middle Low German
MPers.	Middle Persian
Nostr.	(Proto-) Nostratic

OBret.	Old Breton
OEng.	Old English
OGk.	Old Greek
OHG.	Old High German
OIc.	Old Icelandic
OInd.	Old Indic (Vedic, Sanskrit)
OIr.	Old Irish
OIran.	Old Iranian
OLG.	Old Low German
OLith.	Old Lithuanian
OPruss.	Old Prussian
ORuss.	Old Russian
Osc.-Umbr.	Osco-Umbrian
OSlav.	Old Slavic
Osset.	Ossetic
PA	Proto-Andi
PAK	Proto-Adygh-Kabardian (Proto-Adygh, Proto-Circassian)
PAT	Proto-Abkhaz-Tapant (Proto-Abkhaz-Abaza)
PEC	Proto-East Caucasian
Pehl.	Pehlevi (Middle Persian)
Pers.	Persian
PHB	Proto-Hunzib-Bezhta
PIE	Proto-Indo-European
PL	Proto-Lezgian
PN	Proto-Nakh
PNC	Proto-North Caucasian
Prakr.	Prakrit
PTs	Proto-Tsezian
PTsKh	Proto-Tsez-Khawarshi
Punj.	Punjabi
PWC	Proto-West Caucasian
Rheto-Rom.	Rheto-Romanian
Russ.	Russian
Rut.	Rutul
Sax.	Saxon
Sem.	(Proto-) Semitic
Sem.-Ham.	(Proto-) Semitic-Hamitic (Proto-Afro-Asiatic)

Shaps.	Shapsug dialect of Adygh
Sirg.	Sirgokala dialect of Dargwa
Slav.	Proto-Slavic
Sum.	Sumerian
Svan.	Svan
Swed.	Swedish
Tab.	Tabasaran
Tind.	Tindi
Tl.	Tladal dialect of Bezhta
Tok.	Tokita dialect of Karata
Tokh. A	Tokharian A
Tokh. B	Tokharian B
Tsakh.	Tsakhur
Tsez.	Tsez
Tsud.	Tsudakhar dialect of Dargi
Tung.	Proto-Tungus-Manchu
Turk.	Proto-Turkic
Ub.	Ubykh
Ud.	Udi
Ur.	Urartian
Ural.	Proto-Uralic
Urakh.	Urakhi dialect of Dargwa

MOTHER TONGUE
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In Memory of Daniel F. McCall

Numerals of the World I:

Hurrian Numerals

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The best information about the system of Hurrian numerals is given by Gernot Wilhelm (2004a, 115):

	Cardinal	Ordinal	Others
1	*šukki, šuga*?		*šug=am=ġ(e)=a* simple, *šukki* once, *šukka=ni* single
2	*šin(a)*	*šinzi*	*šin(a)=am=ġ(e)=a* twofold, *šin=arbu* two years old
3	*kig(a)*	*kiški* < **kikši*	*kig=ad(i)=ae* three each, *kig=arbu* three years old
4	*tumni*	*tumušše, -unzi*	*tumn=adi* four-spoked, *tumunzalli* one-quarter of a shekel
5	*nariy(a)*	*narišše*	
6	*šeže*		*šež=adi* six spoked
7	*šindi*	*šendešši*	*šinašinda* 14
8	*kira/i*		
9	*tamri/a*		*tamr=am=ġ(e)=a* ninefold
10	*eman*	*emanzi, -assi*	*eman=di* group of ten people, *eman=am=ġ(e)=a* tenfold
13/30	*kigman(i)*		
14?	*šinašinda*		
17/70	*šindeman(i)*		
18/80	*kir(e)man*	*kirmanze*	
10.000	*nubi*		
30.000	*kiga nubi*		

Affixes: *-a* essive; *=adi* collective; *-ae* instrumental; *=am=* factitive; *=ġ(e)=* adjective; *-šše/-š(š)i/-ze/-zi* abstract nouns and also ordinals.

Internal analysis and comparison with Urartian

"1" - Cf. Urartian *šusi-ni* "1", *šuini* "all" (Meščaninov 1978, 284, 292; Diakonoff & Starostin 1986, 38; Gernot 2004b, 133: *šusini* MU ~ 1 MU "one year").
"2" - Diakonoff & Starostin 1986, 37 add Urartian *šî-šə*, separated it from the word *šištini*, which accompanies the ideogram MU "year". But there are also other interpretations, see Meščaninov 1978, 282.
"4" - Hurrian *tumni* "4", *tumunzi* "4th" vs. *tamri* "9" can reflect **t[a]mu-ni*, where in *-ni* the individualizing suffix could be identified (cf. *evre* "lord" : *everni* "king"; see Gernot 2004a, 103).
"7" - Hurrian *šindi* & *šinda-* could represent a compound consisting of roots of the numerals **šin-* "2" & *nariy(a)* "5". The expected cluster **-n+r-* is not typical for Hurrian and could so be replaced by the cluster *-nd-*.
"8" - Hurrian *kira* & *kiri* could represent a compound consisting of roots of the numerals *ki-* "3" & *nariy(a)* "5". Nikolayev & Starostin (NCED 315) speculate about a Hurrian form *miri-* for the numeral "8", but it is probably a misinterpretation of the form *kiri*.

"9" - Hurrian *tamra* & *tamri* could represent a compound consisting of roots of the numerals **tum-* "4" & *nariy(a)* "5".

External comparisons

Since the early stages of research in Urartian and Hurrian the North Caucasian languages represent the most promising candidates for relatives. On the other hand, the areal influence of some of important languages of the ancient Near East cannot be excluded. For this reason two sets of external parallels are prepared, (A) Cultural languages of the ancient Near East; (B) North Caucasian languages as hypothetical relatives.

Table A: Numerals from the cultural languages of the ancient Near East

	Indo-European			Semitic			'Isolated'	
	Hittite	(^{H} = Hier.) Luwian	Mitanni-Aryan	Ugaritic	Eblaite	Akkadian	Sumerian (N 329)	Elamite (EW)
1	*sani-*		*a-i-ka-*	*ảḥd* *ʕšty*		*ištiānum*	**aš* **diL(i)* **g*^{w}*e*	*ki* (459-69)
2	*duya-* *d/tā-*	^{H}*tuwa*^{n}*zi* ^{H}*tuwana*		*ṯnm*	*šina* *šanû(m)* ord.	*šinān*	**min/*nim*	*mar* (876)
3	gen. *teriyas*	^{H}**trinza/i-*	*ti-e-r*^{o}	*ṯlṯ*		*šalaš*	**eweš*	*ziti* (1305)
4	*meyawas*	*māuwa/i-* ^{H}**mawi*^{n}*za-*		*ảrbʕ*		*arba'um*	**lim*	
5		^{H}**panuwa* in *Tapapanuwa* (MONS)IUDEX. QUINQUE Lyc. *p̃nuta-*	*pa-an-za-*	*ḫmš*	*ḫamuš/sum* *ḫamaštu* ord. *ḫamašum* be fifth	*ḫamiš*	**i(a)*	*tuku?* (356)
6	*?waksur* (= $^{1}/_{6}$ *sekan* measures)			*ṯ ṯ* *ṯdṯ* ord.		*šeššet* f. *ši/eššum* ord.	**i-aš(-u)*	
7	*siptamiya-*	*sap(pa)tam-mammi-*	*šatta*	*šbʕ*		*sebe, seba* OAs. *šabe*	**i-min(-u)*	
8		^{H}**8**-*wa*^{n}*zi/a-* Lyc. *aitãta*		*ṯmn*		As. *šamāne*	**i-eweš(-u)*	*barba* 80, cf. *mar* 2? (147)
9		^{H}**nuwi*^{n}*za-* Lyc. *nuñtãta*	*na-a-wa-*	*tšʕ*		*tiše*	**i-lim(-u)*	
10		^{H}*tinata-* tithe		*ʕšr*		*ešer* As. *ešar*	**ḫaw(-u)*	
100					*miat*			

Abbreviations: As. Assyrian, Lyc. Lycian.

Table B: North Caucasian numerals

NCED	Nakh	Avar-Andian	Tsezian	Lakian	Dargi	Lezgian	Khinalug	West Cauc.
*cHə̆ 1	*cħaʔ	*ci-	*hə̃s, obl. *s:ɨ-	ca	*ca	*s:a	sa	*zV
*q̇Hwā̆ 2		*ḳi-	*q̇ʷɨ-nV	ḳi=a	*ḳʷi	*q̇Iʷä	ḳu	*tqI':ʷ
	*šiʔ obl. *šina-							
*ƛHĕ 3		*ƛob-	*λ:ɔl-		*ħab-	*λep:ɨ-		*λ:V
*ś̱wimHV 3				šam=a		*š⁽ʷ⁾imV- -c̣u-r 30	pšʷa	
	*qoʔ							
*hĕmq̇i 4	*=ɦiwʔ	*=uq̇u-	*ʔõq̇e-(nɔ)	muq̇	*ʔawʔa-l	*jewq̇ɨ-	unʁ	
								*p̣ƛ̣ə; cf. '8'
*f̱ɦä 5	*pχi(ʔ)	*ʔin-š:-tu	*λ:i-nɔ	χ:ul-	*χu-	*λ:ʷe-	pxu	*s-xʷə
*ʔrā̆nƛ̱E 6	*jalχ	*ʔinƛ:i-	*ʔẽλ:-(nɔ)	ralχ-	*ʔurik:	*riƛɨ-	zäk	*ƛʷV
*ʔĕrḺɨ̆ 7	*worλ	*hoƛ̣:u-	*ˤɔƛ-(nɔ)	arul	*warʁI-	*u̯irƛ:ɨ-	jiḳ	*bəL'ə
*bū̆nḺe 8	*barλ	*biƛ̣:i-	*beƛ-(nɔ)	malj-	*k:aħ-	*menƛ:ä-	inḳ	
*ʔĭlć̣wɨ 9	*ʔiss	*ho(b)č̣ʷo-	*ʔɔ̃č̣ʷe-(nɔ)	urč̣	*ʔurč̣em-	*u̯ilč̣ʷɨ-	joz	
								*bγʷə
*ʔĕnc̣Ĕ 10	*ʔiṭṭ	*hoc̣o-	*ʔɔ̃c̣ə(-nɔ)	ac̣	*wec̣-	*u̯ic̣ɨ-	jäˤiz	*b-ć̣ʷə
*G̱ə̆ 20	*ṭq̇a	*q̇:V-	*qo-(nɔ)	q̇u	*ʁa-	*q̇:a	q̇a(n)	
*Hlŏšwĕ 100		*bišo-nV		t:urš	*darš:	*wallš:		*ś̌ʷV

Etymologizing the Hurrian numerals in perspective of external comparisons

"1" - Hurro-Urartian _*šu-_ seems compatible with North Caucasian _*cHə̆_ "1" (NCED 323-24).

"2" - Hurrian _šin(a)_ perfectly corresponds to Nakh obl. _*šina-_ "2" (NCED 845-46). But the influence of some of Semitic cultural languages cannot be excluded, cf. Eblaite _šina_ "2".

"3" - Hurrian _ki-_ agrees with Nakh _*qo-_, obl. Chechen _qaʔa-_, Bats _qay-_ (cf. NCED 845). This isogloss seems quite unique, perhaps only Etruscan _ci_ "3" could be added (Orel & Starostin 1990, 61).

"4" - If Hurrian _tumni_ "4", _tumunzi_ "4th" and _tamra/i_ "9" are related (see above), it is possible to speculate about the protoform _*tamu(-)ni_ "4". There are at least two alternative etymologies, based on external comparison:

(i) Connection with Semitic **ṯamānáy-* "8", cf. Ugaritic *ṯmn* /*ṯamānī*/, Syriac *təmāne* etc. "8" (Klimov 1985, 206; Blažek 2001, 26).
(ii) It is tempting to speculate about the prefix **t-* in the numeral *tum-ni* "4", which should correspond with the Nakh masculine class prefix **d-*(< North Caucasian **r-*): Chechen *d=iʔ ber* "four children" vs. *w=iʔ ḳant* "four sons", *y=iʔ yiša* "four sisters" (Dešeriev 1967a, 196-97), similarly Ingush *d=iʔ* "four" (Dolakova 1967, 217); Bats *d=ˤiʔ* id. (Dešeriev 1967b, 235). The class markers also determine the numerals in the Andian languages, usually "1" and "4", but the latter numeral has been determined with exception of Andi by the prefix **b=*: Andi *w=/y=/b=/r=oGogu* "4", but *ce=v/=y/=b/=r* "1" (Cercvadze 1967, 285), further Chamalal *b=oʔu-da* "4" : *se=v/=j/=b/=l/=Ø* "1" (Magomedbekova 1967b, 391), Tindal *b=uʔo-ja* (Gudava 1967d, 372), Karata *b=oʔo-da* "4": *ce=v/=j/=b* "1" (Magomedbekova 1967a, 328), Botlikh *b=uʁu-da* "4" : *ce=w/=y/=b* "1" (Gudava 1967a, 300-01), Godoberi *b=uʔu-da* : *ce=j/=b*, pl. *ce=b/=r* "1" (Godoberi 1967b, 315), Bagvalal *b=ū-ra & b=uʔu-ra* "4" (Gudava 1967c, 360), see also NCED 488-89. If this hypothesis is correct, it is possible to reconstruct the protoform **d=Vmq̇-ni* or **d=Vmʔ-ni* as the predecessor of Hurrian *tumni*.

"5" - There are no apparent parallels to Hurrian *nariy(a)* "5" among other designations of the numeral "5" in languages of either the Caucasus or the ancient Near East. But one promising cognate could be identified in North Caucasian **ʔrā̆nƛ̱E* "6", if it is analyzable as a compound **ʔrā̆n-* *"5" & **ƛ̱E* . The latter component is derivable from the North Caucasian verb **=äƛËw* "to lie, put, lead" > Nakh **=ill-* "to lie, put upon (something)", **t-ill-* "to put (from above)"; Chamalal *=aλ-* "to begin"; Tsezian **ɔL* "to be"; Bezhta *=oλ-*, Gunzib *=ol-* "to finish"; Lezgian **ʔeλ:ʷɨ-* "to put, lie"; West Caucasian **λ'ə-* "to lie" (NCED 278-79). The primary semantics could be "six" = "(one) put upon five" or "beginning the (new) five". A similar structure is assumed for Indo-European **(K)sṷeḱs* "6", namely **ĝʰes-* "hand" & **ṷeḱs-* "to grow, rise" (**-ḱ-* is confirmed by Lithuanian *vešė́ti* "to grow vigorously, thrive; prosper, flourish"), i.e. "overgrowing the hand" (see N 239-41).

If one accepts the so called Sino-Caucasian macrofamily, attractive external cognates to the first component appear in Burushaski of Hunza *-ríin & -ríiń*, pl. *ríińćiń*, Nagir pl. in °*ćań*, Yasin *-rén*, pl. *-réiń(ćiń)* "hand" (Berger 1998, 364-65) and Sino-Tibetan **ri* > Mikir *ri & ri-pak* "hand", *rikan* "forearm", *eri* "arm", Tamang *nā:ri* "arm" (Matisoff 1985, 446). John Bengtson drew my attention (p.c., Feb 27, 2008) to Yeniseian **ŕɔŋ* "hand" (> Ket *ľaŋ* "hand", compared directly with Burushaski *-riŋ* id. including the possessive prefixes by Toporov 1971, 114) and Basque **a-rrae* "palm, span". Cf. also Old Chinese **prāʔ* "handful", derived from Sino-Tibetan **PaH* "palm of hand" (CVST I, 92-93), which could reflect ***r-pāʔ* and so exactly correspond to Mikir *ri-pak* "hand". This etymon could serve as a key to the etymology of Sino-Tibetan **rŭk* "6" (CVST II, 105), if it is analyzable as a compound of **ri* "hand" and the numeral "1", attested e.g. in Bahing, Thulung *kwoŋ*, Balali *ikkū* etc. (Hodson 1913, 320), cf. also Miri *ákkéńkɔ* "6", which represents a transparent compound of *akɔ* "1" & *ańɔkɔ* "5" (Gowda 1983, 424).

"6" - Most probably Hurrian *šeže* "6" reflects a loan from Akkadian (cf. *šeššet* "6", *ši/eššum* "6th") or Eblaite, but the numeral is unknown here.

"7" - Hurrian *šindi* "7" and *-šinda* in *šinašinda* "14" = "2 x 7" cannot be borrowed from Akkadian (so Diakonoff & Starostin 1986, 20, although they did not determine a source). The etymology based on the quinary system, i.e. the compound **šin- & *nariy(a)* "2+5" (see above), is in agreement with etymologies of the higher numerals, "8" and "9".

Note: Diakonoff & Starostin (1986, 20) tried to find the numeral "7" in the word *fair* (in their transcription *φâîr*), interpreting it as a designation of the Pleiades, whose name frequently means "seven stars". If it is so, the word may actually be compatible with **u̯ĕ-ʔĕrL̠ɨ̆* "7" with the class prefix **u̯ĕ-*.

"8" - Hurrian *kira* ~ *kiri* is derivable from the compound of **ki-* & **nariy(a)* "3 + 5", reflecting so an application of the quinary system (see above).

"9" - Hurrian *tamri* ~ *tamra* is derivable from the compound of **tum-* (< **tamu-*?) & **nariy(a)* "4 + 5", which is again based on the quinary system.

"10" - Hurrian *eman* has no apparent counterpart in the systems of numerals of languages of both the Caucasus and ancient Near East. J. Bengtson (p.c.) drew my attention to Basque *(h)amar* "10", *(h)ama-eka*, *ama-ika* "11", *amastarrika*, *amaxarri* "a las cinco piedras" (DEV 847-49, 694). But it is possible to speculate about the primary meaning "hand", "handful" or "fingers", if the final *-n* reflects the Hurrian plural relator *-na* (cf. Gernot 2004a, 106-08) or Hurrian adjectival suffix *-n(n)i* (Gernot 2004a, 106), expressing so one of the possibilities, the plural of **ema-* or "belonging to **ema-*" respectively. The meaning of the hypothetical base **ema-* cannot be determined from Hurrian, but there are interesting North Caucasian forms:

(i) **mēħwV* (NCED 801-02), attested e.g. in Lak *ḳʷi-jama* "handful", lit. "two (cupped) hands"; Akusha *meħ* "hollow of hand, handful"; Udin *aIm* "arm, wing"; Abkhaz **ma* in *a-ma-cᵛá* "finger", *a-ma-χʷár* "arm".

(ii) **mHŏχ̠ɨ̆* (NCED 819), attested in Tsezian **mɔχV* "handful"; Lezgian **χ:am* "hand(ful), palm of hand".

Outside of North Caucasian, cf. Sino-Tibetan **mu·k* ~ **mu·ŋ* "(fore)arm, hand" (Matisoff 1985, 445).

"10.000" - Hurrian *nubi* & *inubi* meant originally probably "very many". Diakonoff & Starostin (1986, 70) identify here the collective suffix *-bi*, corresponding to *-(i)bə* in Urartian *nir(i)bə* "property", *atibə* "10.000", and the East Caucasian plural suffix **-p·V* > Rutul, Gunzib, Axwax *-ba*, Dargwa, Tsezian, Awar, Tindal, Bats *-bi*.

Conclusions

In the present comparative-etymological analysis of the Hurrian numerals the following conclusions can be formulated:

(1) For the numerals "1", "2", "3", "4" there are striking East Caucasian etymological counterparts. In the case of "2" and "3" they represent exclusive Nakh-Hurrian isoglosses. The numeral "4" preserves the dental class prefix, common for both Hurrian and Nakh (& Andi).

(2) The numeral "5" is etymologizable in the wider circle of the Sino-Caucasian languages as the "(palm of the) hand". In North Caucasian the same etymon can be identified in the numeral "6" (*"beginning the new five"?).

(3) The numeral "6" was borrowed from Akkadian.

(4) The numerals "7", "8", "9" were formed via the quinary pattern.

(5) The numeral "10" may also be etymologized as "hands, handful" or so on the basis of East Caucasian. The same can be said about other hypothetical external counterparts.

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MOTHER TONGUE
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In Memory of Daniel F. McCall

Numerals of the World I: Nilotic Numerals

Dedicated to the memory of M. Lionel Bender (1934-2008)

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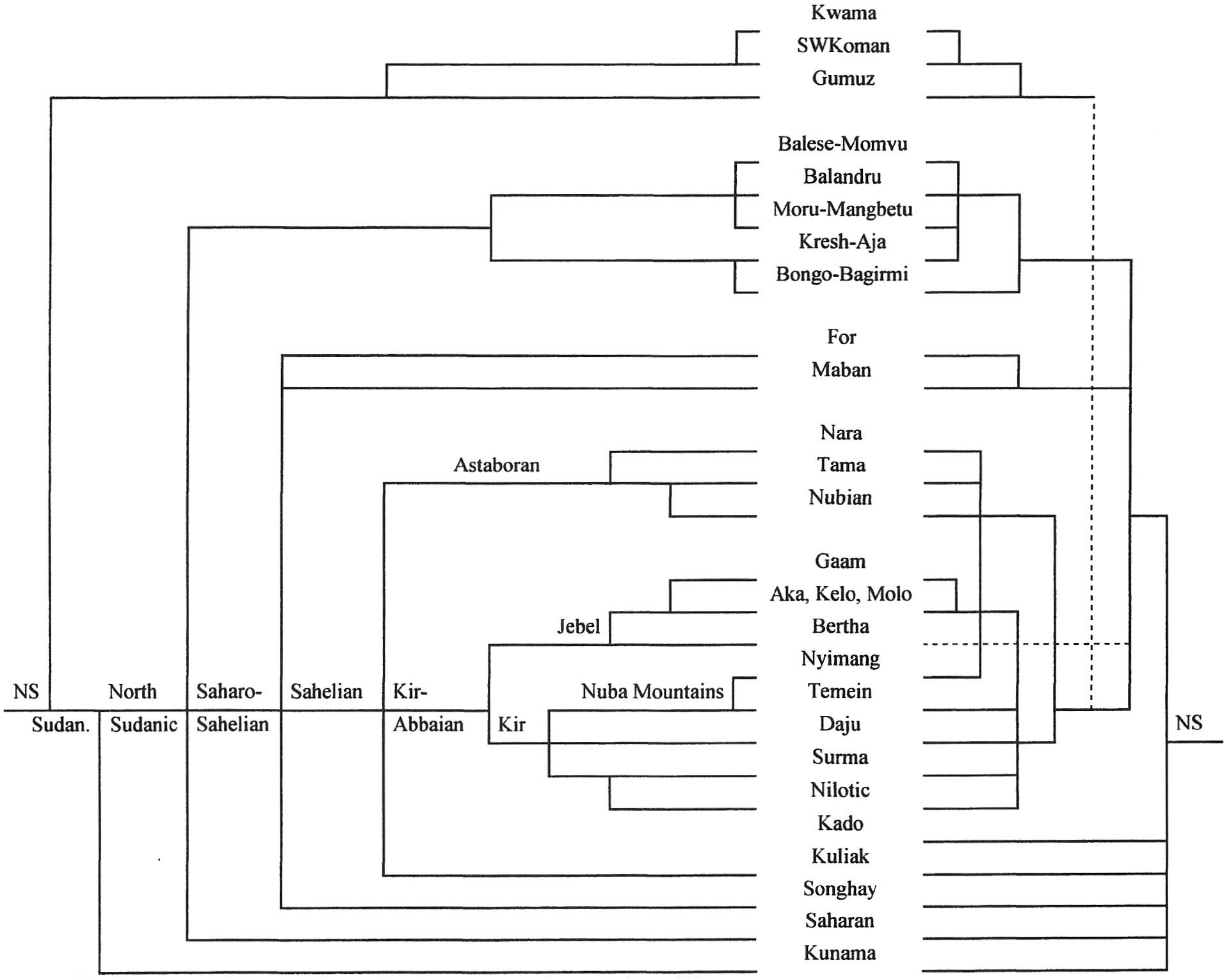
Brno, Czech Republic

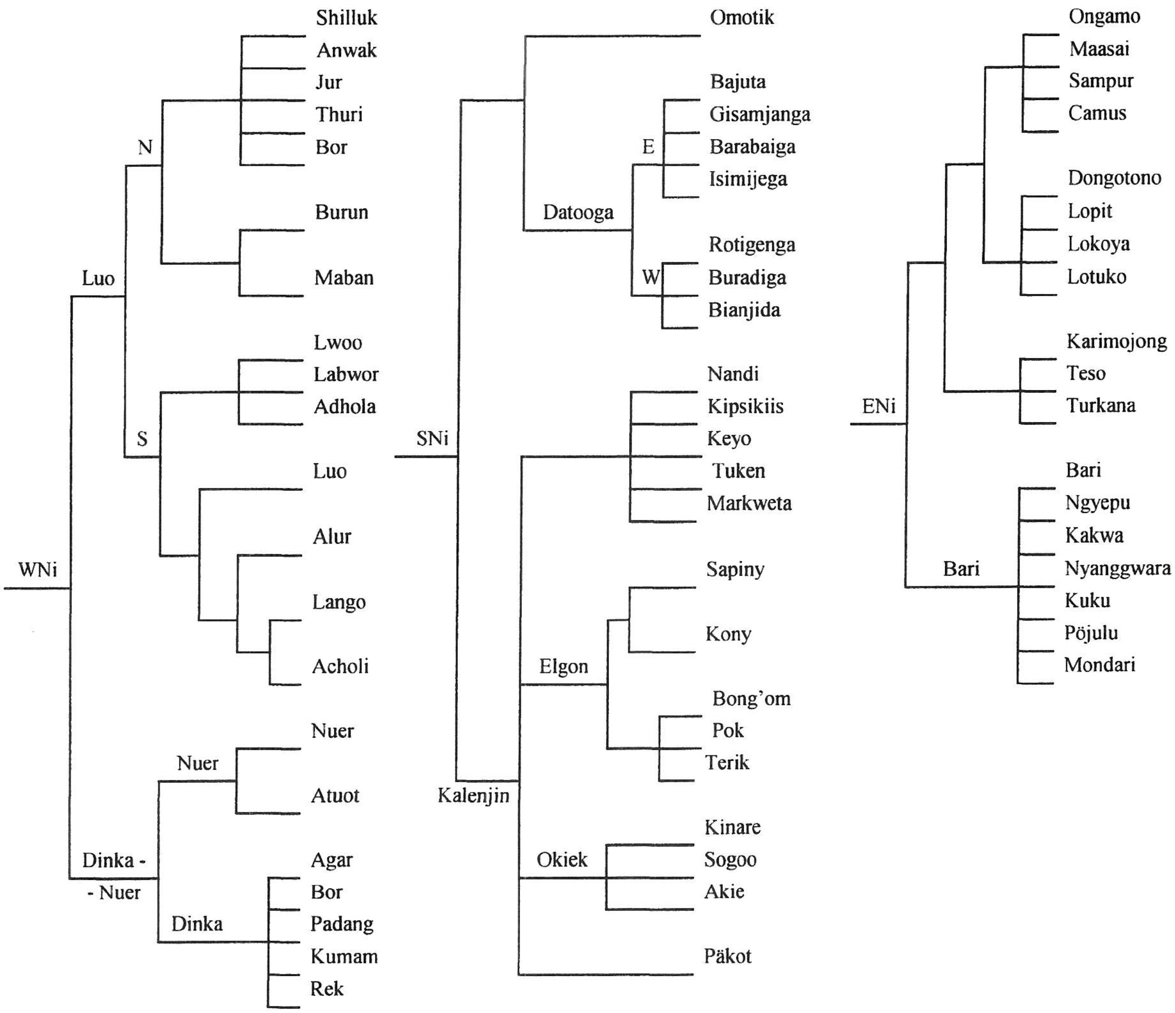
The purpose of the present study is to summarize all important data on Nilotic numerals, to analyze them in the Nilo-Saharan, sometimes Congo-Saharan, context, and finally to try to interpret their internal structure from the point of view of a system of counting.

The Nilotic languages represent a part of the vast Nilo-Saharan phylum. Although its classification is not definitive, there is almost a *communis opinio* concerning the position of the Nilotic family. Let us compare the most recent attempts of two scholars, Chris Ehret (1993: 104-106; left) and M. Lionel Bender (1992b: 16-19; 1996: 59-64; right):


Kwama
SWKoman
Gumuz
Balese-Momvu
Balandru
Moru-Mangbetu
Kresh-Aja
Bongo-Bagirmi
For
Maban
Nara
Tama
Nubian
Astaboran
Gaam
Aka, Kelo, Molo
Jebel
Bertha
Nyimang
Nuba Mountains
Temein
Daju
Surma
Nilotic
Kado
Kuliak
Songhay
Saharan
Kunama
NS
Sudan.
North
Sudanic
Saharo-
Sahelian
Sahelian
Kir-
Abbaian
Kir
NS

Note: The interrupted line - - - - is used only to express the crossing of lines.

The Nilotic family consists of three branches. Their partial classifications look as follows: Western (Reh 1985: 4), Eastern (Vossen 1982: 296) and Southern (Rottland 1982: 255):


WNi
Luo
N
Shilluk
Anwak
Jur
Thuri
Bor
Burun
Maban
S
Lwoo
Labwor
Adhola
Luo
Alur
Lango
Acholi
Dinka -
- Nuer
Nuer
Nuer
Atuot
Dinka
Agar
Bor
Padang
Kumam
Rek
SNi
Omotik
Datooga
E
Bajuta
Gisamjanga
Barabaiga
Isimijega
W
Rotigenga
Buradiga
Bianjida
Kalenjin
Nandi
Kipsikiis
Keyo
Tuken
Markweta
Elgon
Sapiny
Kony
Bong'om
Pok
Terik
Okiek
Kinare
Sogoo
Akie
Päkot
ENi
Ongamo
Maasai
Sampur
Camus
Dongotono
Lopit
Lokoya
Lotuko
Karimojong
Teso
Turkana
Bari
Bari
Ngyepu
Kakwa
Nyanggwara
Kuku
Pöjulu
Mondari

An overview of underived numerals in Nilotic languages:

	Nilotic	West Nilotic	East Nilotic	South Nilotic
	(cf. Dimmendaal)	(Reh)	(Vossen)	(Rottland)
1	*_kɛ[l]_	*_kɛl_	? > Ba _bu-kɛr_ "6" = "[5]+1"	Da *_agi_ & *_agalɛɛl_, cf. Ka *_akɛɛŋkɛ_ "1", *_akɛ_ "other"
	*_tɔ[k]_	Di _tok_, La _dek_	Ba _tɔ_	
			LoMa *_-bo-_, TeTu *_-pe[y]_	
2	*_aRyɛw_	*_(a)riou_	*_rɛ(-k)_	*_aRyeñ_
3	*_dök_	*_dAk_	? > Ba _bu-dök_ "8" = "[5]+3"	
			TeLoMa *_-(k)uni-_	
				*_somok_
			Ba _(mʊ-)sala_	
4	*_(ɔ)ŋwan_	*_-ŋuan_	*_-ŋuan-_	*_aŋwa(a)n_
5	*_m[ue]t_		LoMa *_-miet-_	*_muut_
	*_kan[i]_	La _kañ_	TeTu *_kan[i]_	
		*_bdh(y)ek_ = "5 x 1" ? > DiNu *_[v]dhyec_ SBu _doi(k)_ Lw *_abic_		
10	*_tɔmɔn_	La _tomon_	TeLoMa *_tɔmɔn_	*_tɑmɑn_
		*_bth(y)aar_ = "5 x 2"? > Di _thiaar_, older _vtiar_ Lw *_apaar_		
			Ba _mere_	
		Ku _asai_, Mu _cai_, Ulu _ko-sai_		
			Ba _pwök_ & _fwök_	
		Nu _wal_ & _wel_		
				Da *_muquš_

Abbreviations of languages: Ba Bari, Bu Burun, C Central, Cush Cushitic, Da Datooga, Di Dinka, E East, Ka Kalenjin, Ku Kurmuk, La Lango, Lo Lotuxo, Lw Lwoo, Ma Maa, Mu Mughaia, N North, Ni Nilotic, Nu Nuer, Nub Nubian, P- Proto-, S South, Sud Sudanic, Te Teso, Tu Turkana, W West.

Abbreviations of authors: Ba = Barth, Be = Bender, BeAy = Bender & Ayre, BG = Bechhaus-Gerst, Bo = Boyeldieu, Br = Bruel, Bt = Beaton, Ca = Cailliand, CR = Conti Rossini, De = Decorse, Df = Delafosse, Ed = Edgar, Eh = Ehret, EP = Evans-Pritchard, Fl = Fleming, GD = Gaudefroy-Demombynes, Gr = Gregersen, Gu = Guthrie, Hb = Haberland, Jg = Jungraithmayr, Ko = Koelle, Lk = Lukas, Ma = Marno, Me = Meinhof, Mi = Migeod, MM = MacMichael, Re = Reinisch, Sa = Santandrea, Sch = Schadeberg, Se = Seligmann, Sp = Spagnolo, TDB = Triulzi, Dafallah & Bender, Th = Thompson, Tl = Thelwall, We = Westermann.

Comparative-etymological analysis

1.1. Nilotic *_kɛ[l]_ "1" // SESurma: Kwegu (Be) _càal_ "all" // CSud *_kala_ "1" (Bender 1992b: 48-49, # 231) > Kara (Sa) _kál_ = (Bo) _kàl_, Yulu (Sa) _kal(a)_ = (Bo) _käal_, Tele (Br) _kara_ = (De) _kida_, Barma = Bagirmi (De) _kede_ etc. "1" // Taman (Ed): Mararit _kára_, Abu-Shaarib _karre_, Sungor _kur_, Erenga _kúr_ etc. "1" // For (Bt) _ker_ "another".
The forms without the initial _k-_ (Kunama _ɛlla_, Ilit _ella_ // CSud: Balese-Obi _eli_, Moru _àlʊ_ etc. "1" // Maban: Maba _illek_, pl. _illi_ "that one") can be also related if the article-like function of the '_k_-mobile' is accepted (cf. Greenberg 1981: 105-12; further Ehret 2001, 543-44).

There are also remarkable parallels outside NS, namely in Mande branch of Niger-Congo: Bozo of Tiye *kwõ*, Malinke *kiliŋ*, Khassonke *xelĩ*, Manya *kélẽ*, Dyula *kele*, Bambara *kelẽ*, Susu *kérẽ*, Loma *hila*, Mende *yéla*, Bandi *ŋgila* etc. "1" (see Mukarovsky 1971: 142 who reconstructed Proto-Mande **kwila*).

1.2. Nilotic **tɔ[k]* "1" // Nara (Re) *toko & doko*, (Th) *dokku* // Berta of Mayu (TDB) *d’uk’unu*, Qamamyl (Ca) *mu-duku* (with the prefix *mu-* common for all the numerals 1-5) and / or Bertha *dé:gó* "first" // Maban: Kodoi (GD), Maba (Ba) *tek*, (Ed) *tɔ́ɔ*, Masalit *tóo*, Aiki *tùwá* // Kuliak: Nyangi (Fl) *odok / -dok*, (Eh) *nardok* // For: Fur ("Kondjara" by Me) *tok & di(i)g* = (Bt) *tɔk & dik* (the latter form is used when objects are being counted one by one), Mimi (GD) *deg* // Kadu = Krongo-Kadugli: Kadugli (Me) *nɔ́ɔ̀tɔ̀k* = Talla (Sch) *ŋ́ŋatɔk*, Miri (Me) *ńɔŋɔtɔ́k* = (Sch) *ŋɔttɔk*, Mudo = Tulishi *kɔ́ttɔk* "1" // Koman: Uduk *tēkēlátēkēl* "only a few, one there and here" (Ehret 2001, 428: Uduk+Maban+Bertha).

Apparently, the same root form other numerals on the basis of elementary arithmetic operations (6 = 5 + 1, 10 = 10 x 1, 20 = "one man" ?, etc.):

"6": Gaam (BeAy) *ṭəlḍig* "6", cf. *ídígḍáag* "7" vs. *ḍáag* "2", Hamej (Me) *teldig* "6", cf. *dedigendák* "7" vs. *daak* "2"; similarly Koman: Fungi = Ghule (MM) *dilodik* "6".

"10": Taman (Ed): Miisiiri *martik* "10" vs. Maraarit *tok* and Tama *merr*, Erenga *mer* "10" (the external parallels confirm the primary meaning "10" for the form *mer* etc., in spite of Maraarit *tók wàri* "20" vs. *wàrí* "2");

Maban: Maba (Ba) *atúk* = (Ed) *ɔ̀túk*, Masalit *ùtúk*, Aiki & Kibet *ituk* etc.

CSud: Barma = Bagirmi (Ba) *duk keme* "10", *duk sab* "20" : *sab* "2", Sara Dendje (De) *doko*, Mbai (Bruel) *dog* etc. "10"

"20": Nara (Th) *dokkuta* "20" : *dokku* "1" (cf. Kunama *koella* "20" = "one man" : *ella* "1").

There are also very suggestive external parallels: Kordofanian: Katla (Me) *ṯaaṯák* "1" /// WAtlantic (Ko): Bagnum *nonduk*, Bidjugo *módige*, *nediga*, Nalu *dendeg* "1" // Gur: Tamprusi (Gr) *dike* etc. "1" // SCNiger-Congo: Ewe (We) *d’èká*, F8 of Dahome (Df) *d’òkpá*, Logba (We) *tikpè*, Ahlo (We) *dígbo*, Gwa *dogbo* (Gr). The Mande examples quoted by Gregersen (1972: 85, #55) as Malinke & Dan *do* "1" reflect probably a stem **taN* (*N = n / l*), cf. Nwã *dõ*, Vai *dɔndɔ*, Bisa of Lebir *dene*, Kpelle *tɔnɔ & taaŋ*, Bobo *tele* etc. "1" (see Mukarovsky 1971: 142, 144).

1.3. ENilotic: LoMa **-bo-* (& TeTu **-pe[y]* "1" ?) // Kuliak: Ik (Eh) *ibe* "alone". Is it comparable with Proto-Nubian (BG) **bɛr* "1" ?

2.1. Nilotic **aRyɛw* // PNubian **arui* > Haraza *auriyah*, Kundugr *ore*, Kadaru *ɔrro*, Dongola *áauwi*, Kenzi *owwi* etc. (Blažek 1998: §2) // Nara (Th) *arriga* // Taman **warri* > Tama *wárɛ*, Erenga *wàrrí*, Abu-Sharib *werre* etc. (all Ed) // For: Fur (Bt) *awu* = (Me) *au*, *weu* // CSud **ariu* > Lendu (Tu) *arɔ̃*, Moru (Tu) *ärrɪ*, Bulala (De) *rwio*, Kuka (Ba) *riyoo*, Kresh (Sa) *rɔmɔ* etc. // SW+ESurma **[ar]rama(n)* > Didinga, Murle *ramma*, Murle *ram*, Meqan *rama*, Tirma *r/naman*, Bodi *rámma*, Mursi *(ar)ráman* (all Hb) // Afitti *armak*; Nyimang *ár(m)bà* // Kadu (Sch): Yegang *aríya*, Krongo *yáária*, Talasa *ɛ́ɛ́rya*, Miri *ɛ́ɛ́ra*, Mudo = Tulishi *kaará* etc. - all "2"; Kunama: Ilit (Be) *eera* "other" /// Songhay of Timbuktu *kari* "twin" (Greenberg 1963: 107, #119; 127, 399; 146, #142). The same root also form higher numerals: "7": Nara (Th) *jariga* "7" : *arriga* "2", cf. *dessaana* "8" : *saana* "3" // Bertha: Bertat (Ma) *ari* "7" // ?Maban: Mimi (GD) *rom* "7";

"20": Nile Nubian **arri* > Old Nubian *arre-*, Nobiin *áróo*, Kenzi-Dongola *ari* "20" (Blažek 1998: 333).

There are untrivial derivatives in Saharan: (i) Kanuri-Kanembu **arasku* "6" is apparently formed by **asuku* "3". It would imply **ar-* = "2", similarly as in the neighboring Kotoko languages of the Central Chadic affiliation: Gulfei *frekra* "6" : *akra* "3", *fregande* "8" : *ngandé* "4" etc. (Blažek 1997: 164; Ehret 2001: 542). (ii) Kanuri-Kanembu **tullor* "7" can be derived from **tullo* + **ugu* + **ar* = *"[1 x 5] + 2", cf. Teda-Daza **tudesiu* "7" vs. **ciu* "2" (Blažek 1997: 165).
Bender (1996: 106, #175) adds Kanuri (Lk) *rétà̱* "half" and Tubu (Lk) *arenee* "foreign" = Teda (Coeur) *ɔrnɛ*, pl. *arna* id.
Outside of Nilo-Saharan, some West Atlantic forms should be comparable: Wolof (Ko) *yaar* = (Mi) *nyar*, Landuma (Mi) *mara* "2" (*ma-* also forms the numerals "3" & "4").

3.1. Dimmendaal (1988: 60, #180) reconstructed Nilotic **däk* "3" on the basis of WNilotic **dAk* "3" and the numeral *bu-dök* "8" in the only representant of the ENilotic branch, namely Bari. But the numerals 6-9 in Bari are apparently borrowed from some WNilotic source, because they are formed on the quinary pattern based on the WNilotic numerals 1 - 4:

Bari (Spagnolo)				Lango (Conti Rossini)				Shilluk (Kohnen)			
1	*tɔ*	6	*bu-kɛr*	1	*dek*	6	*ape*	1	*akyel*	6	*abi-kyel*
2	*öri*	7	*bu-ryo'*	2	*aryoo*	7	*wu-aryoo*	2	*aryow*	7	*abi-riow*
3	*sala*	8	*bu-dök*	3	*adek*	8	*wu-adek*	3	*adak*	8	*abi-dak*
4	*iŋwan*	9	*bu-ŋwan*	4	*aŋwen*	9	*wu-aŋwen*	4	*aŋwen*	9	*abi-ŋwen*
5	*kanat*	10	*pwök*	5	*kañ*	10	*tomon*	5	*abic*	10	*pyaro*

The closest cognates appear in Nubian: Meidob (MM) *urpii-n deka* "third finger, middle toe" where the first component corresponds with *orbidi* "arm" and maybe Karko *to̱kise̱* "8" (Blažek 1998: 336). Other parallels are more or less problematic:
Bender (1981: 266) compared WNilotic **dAk* "3" with Kuliak, viz. Ik (Eh) *aɗat* "3". On the other hand, Fleming (1983: 470) saw cognates of the Ik numeral "3" in East Jebel counterparts (EP): Sillok, Aka *eede*, Tornase *ede*, Malkan *odo* etc., cf. Bertha: Gobato *mo-udi'*, Mayu (TDB) *mu-uθe*, all "3". Gregersen (1972: 87, #72) added Kresh (Sa) *tɔtɔ* "3", suggestively resembling Bantu (Gu) **-tátù* "3", but e.g. Baka (Sa) *ɔta* supports a common Central Sudanic origin, besides the extra-Nilo-Saharan data:
Kordofanian (Se): Eliri *etak*, Talodi *aidak*, but Lafofa *(ba-)tad(-an)*, Katla *attat*, Tagoi *(y)ita* etc. "3" (Greenberg 1963: 159, #43);
WAtlantic: Serer (Migeod) *todak* = (d'Avezac) *tadak* (the final *-k* terminats all the numerals 2-5), besides Ful *tati*, Limba *(bi-)tat*, Wolof (Ko) *yaat* etc. // Gur: Gurma *ta*, Bariba *ìtá* etc. // Togo remnant lgs.: Ahlõ *itá*, Animere *àtá* etc., and other SCNiger-Congo: Kwa: Ga *étɛ*, Yoruba *ɛ̀ta*, East Igbo *ìtó* etc.; Bantu **-tátù* (Greenberg 1963: 22, #43; Mukarovsky 1976: 383, #542 reconstructed PWNigritic **-THÁTHU*).
In spite of Ehret (1983: 163) the comparison of WNilotic **dAk* "3" with Kanuri-Kanembu **diga* "4" is unconvincing for semantic difference (cf. Blažek 1997: 163).

3.2. ENilotic: TeLoMa **-kuni-* m. / **-uni-* f. // Surma (Hb): (SE) Yidinit *gíi'en*, *jíi'ɛ̀n*, (SW) Didinga & Longarim *iyo*, Murle *iiyu*, *hiyo* // Kuliak (Eh) **iyɔn* // Gumuz (Be): Sese *okáŋ*, Sai *okak*, Gojjam *okaag*, *úkag*, Kokit *okaga* // CSud (Tu): Moru **ńna*, Lokai *ɪna*, Lulu'ba *náà*; Balese (Vorbichler) *ɛ̀cɪ-nà*, Mamvu *je-nɔ̀* etc. // ?Kadu (Sch): Mudo = Tulishi *t̪ɔ́ɔ́na*, Yegang = Keiga *ɗɔ́ɔ́na*, Talla = Kadugli *aad̪oona* etc., all "3" // ? Koman (Be): Twampa *dɔnɔn*, Gule *dunnume* "3" (Bender 1996: 111, #207 connects only Kadu + Koman).

There is also South African Khoisan (S+C+N) **!nwana* "3" which could be related to a hypothetical substratal source of this Nilo-Saharan numeral.

3.3. Bari (Sp) *sala*, numeral adj. *mʊsala* "3", is isolated not only within East Nilotic or Nilotic, but even within the Nilo-Saharan. There are two possibilities:
(i) The Bari numeral was borrowed from Dinka (Mi) *callic* "middle, half, centre; middle finger" and "third".
(ii) The Bari numeral was borrowed from some of Bantu languages of the neighboring region, cf. Lubu-sese *-salɔ*, *-sarɔ*, Ababua-Mobenge *-salu*, Ba-Buti *-salɔ*, *-satu*, Abobwa, West O̲-ko̲ta *N-šalɔ*, *N-calɔ*.

3.4. ENilotic **somok* "3" also stands isolated within both Nilotic and Nilo-Saharan. There are only East African Khoisan parallels: Hatsa *samaka-pi* "3" (the suffix *-pi* forms all the numerals 2-5: *piye-pi* "2", *bune-pi* "4", *asu-pi* "5") and Sandawe (Kagaya) *som(u)ki-x(i)* "3" (cf. *ts'exe* "1", *kiso-x(o)* "2", *haka-x(a)* "4"). The similarity is apparent, but the question, who borrowed from whom, remains open.

4.1. Nilotic **(ɔ)ŋwan* "4" // NSurma: Majang & Shaba *aŋan* // WKuliak (Eh) **nowa'* > So *nowa'*, Nyangi *nɔwɛ́* // Bertha: Qamamyl (Ca) *ma-namo*, Fadashi (Be) *m□n-nə́mu* // For: Fur (Me) *on(g)al* = (MM) *ungal*, Mimi (Jg) *ɔ́ŋɔ́ɔ̀l* // Koman **(d-)oŋon* "4" > Twampa (Be) *dóŋòn*, Komo *dɔgɔn-in*, Anej *duk-*, besides Opo *(a)ŋwan* // ? East Jebel (EP): Silak *lŭla*, Malkan *lulus*. Ehret (2001, 380) compared only Nilotic+Surmic+For.
There are suggestive extra-Nilo-Saharan parallels (cf. Gregersen 1972: 83, #34):
Kordofanian: Kanderma (Se) *malu* "4" /// WAtlantic: Ful (Leith Ross) *nai*, Limba *bi-naŋ*, Nalu (Ko) *bi-nani*, Temne *p'-aŋlɛ*, Landuma *mắṅgele*, Bul-Mmani *nyɔl* etc. // Mande: Soninke *naġato*, Bozo of Kélinga *naana*, Bambara *naani*, Bobo *na* (Mukarovsky 1971: 142) // Gur: Konkomba *nna*, Sisala *na* // Adamawa: Mbum *nyiaŋ*, Munga *nyin* // SCNiger-Congo: Proto-Ijo **ini*, Bantu (Gu) **-nà*, **-nàyɨ́* etc. (Greenberg 1963: 18, #23; Mukarovsky 1976: 283-88).

5.1. A common denominator for SNilotic **muut* and ENilotic (LoMa) **-miet-* "5" could be a protoform of the type **muet-*. The external parallels in other Nilo-Saharan languages support it:
Daju (Tl) **madək* "5" > Sila *muduk*, Nyala, Liguri *mədək*, Lagowa *madak*, Shatt *mədak* // Koman (Be): Twampa *múud̲ɛ̀d̲*, Opo *muta-kwei*, Kwama *kumbut*, Anej *du-budi* // CSud: Ngama, Barma, Sara etc. *mi* (all De), Kenga (Ba) *mii*, Bongo (Sa) *müi*, Kuka (Ba) *muii* etc., and perhaps Nara (Th) *wiita* and For: Mimi (Jg) *wɔ́t*.
The most natural etymological motivation for the numeral "5" is the word "hand". There is a promising candidate in Koman: Twampa *mèɗ*, Kwama *miit*, *(m)biit*, *bɛt'*, Opo *bit-/-mit'*, Anej *bit'ɛn* (all Be).
Highland East Cushitic **omut-* "5", isolated within East Cushitic, Cushitic and Afroasiatic, can be borrowd from some Nilo-Saharan source.

5.2. Within WNilotic there is an isolated form for the numeral "5" in Lango *kañ*, resembling its ENilotic counterparts: Teso *-káñì*, Turkana *ŋa-kànɪ*, Karimojong *-qan*, Bari *(mʊ-)kánat* "5". It is not clear if the Lango numeral "5" is inherited from a common Nilotic source or borrowed from an ENilotic source.
There is a natural etymology based on the word "hand" attested in ENilotic **-k_3aɪn-* "arm, hand" // Kunama (Be) *kɔɔna*, Ilit *kona*, cf. Kunama (Re) *kussume* "5" < **kon-sume*. Bender (1996: 320,

#133) also finds relatives in CSud "fingernail, claw": Moru-Madi **$k^{(w)}$ɔñi*; Kresh **koni*; Bongoid **koño* (cf. Bender 1992: 42). The semantic dispersion "hand" - "finger" allows us also to include the numeral "1" here: Surma: Bodi (Hb) *kónna*, Meqen (Hb) *kon*, Mursi (Turton & Bender) // Kuliak: Ik (Eh) *kɔn*^{a} "1".

It is also tempting to add Niger-Congo data: Atlantic: Gola *ó-kpɔnɔ̀* // Gur: Gurenne *kàn-ga*, Dagara *kpã* // Kwa: Grebo *kwá*; Bantu **-kónò* "arm, hand" (Mukarovsky 1976: 209 reconstructs PWNigritic **-kwán-*).

A Nilo-Saharan origin seems to be quite probable for the Cushitic counterparts (ECushitic **ken-/ *kon-* // South Cushitic **ko'an* // Agaw **'ank*^{w}*-* < **k*^{w}*an-* "5") which are without any internal etymology.

5.3. Reh (1985: 36) reconstructed two forms for "5" in WNilotic, namely DiNu **dhyec* and Lw **a-bic*, which seem to be quite incompatible. I am convinced that it is possible to prove their common origin. First let us confront the old and recent records of Dinka numerals:

authors	1	2	3	4	5	6	7	8	9	10
Mitterrutzner 1866	*tok*	*róu*	*dyak*	*'nguan*	*wdyec*	*wdetem*	*wderóu*	*bêt/d*	*wdenguan*	*wtyer, -ar*
Nebel 1936	*tok*	*rou*	*dyak*	*ŋwan*	*dhyec*	*detem*	*dhorou*	*bɛt*	*dhoŋwan*	*thyaar*

It is evident at least for the numerals "7" and "9" that they represent compounds 5 + 2 and 5 + 4 respectively. The old transcription *wdyec* in confrontation with Lw **-bic* allows us to reconstruct a hypothetical starting-point **bdyec*, similarly *wtyer/wtyar* "10" vs. Lw **-paar* "10" are derivable from **bt(y)ar* (cf. 10.2). If the latter protoform reflects a compound of the word "hand/arm" (Lw **bat* > Lwoo *bat*, pl. *bede*, Acholi *baát*, pl. *baád*) & the numeral "2" (WNilotic **(a)riou*), one would expect the internal structure "hand".."one" for the numeral "5". We should seek the second component among forms of the type Lango *dek* rather than directly in Dinka *tok*. The development **bat* & **dek* > **bdek* > **bdyec* etc. seems quite plausible. The change of the final **-k* > **-c* calls for an explanation - cf. Jumjum (EP) *doi(k)* "5".

Greenberg (1963: 99, #52) compared DiNu forms with common Nubian (BG) **dišši* "5". Elsewhere (1998: §5) I tried to analyze the internal structure of this Nubian numeral, reconstructing a compound of **diK-*, hypothetically "1" (unattested in the Nubian languages, but well documented in other Nilo-Saharan branches - cf. 1.2.) & the word "hand, [set of] fingers", really appearing in Dilling *iišii* "hands, arms", Gulfan *osie* "finger", Meidob *usi* "hand", etc. (Meinhof 1918-19: 180-81). Murray (1923: 141) added Gaam *oos* "hand"; cf. also Fur (Me) *os* "5".

The pattern "5" = "one hand" is also recognizable in other African language families, e.g. Kordofanian: Eliri *č-ébin gela* "5" : *č-ebin* "hand" x *elle* "1", Lafofa *g-re g-um* "5" : *g-omi* "hand", Talodi *č-e-kun-j-ilik* "5" : *yílik* "1" (Meinhof, *ZKS* 6[1914]: 252).

6. - 9.

The WNilotic numerals 6 - 9 were undoubtedly based on the quinary system which is well preserved e.g. in Shilluk, Nuer or Lango. From WNilotic the quinary system was borrowed into Bari (see 3.1.). There are certains exceptions:

Luo (Stafford) *ongačiel* "9" = *onge* "be absent" & *ačiel* "1"; the numeral "8" can perhaps also be based on the subtractive pattern:

Luo (Stafford) *aboro* "8" ("minus two" ?) : *abiriyo* "7" (= "5 + 2"), Acholi (Sa) *àbóòrò* : *àbï-ïr(y)ɔ̀*, Alur (Ringe) *abora* : *abɪrɔ*, etc.;

Dinka *(w)detem* "6" : *det* "second", i.e. "[the initial numeral of] the second [pentad]" (?), *bêd* / *bɛt* "8" - from expected **bat & dyak* = "hand" + "3" (?).
A more complicated situation is in the Burun group (recoded by EP) of the WNilotic branch:
The quinary pattern is well preserved in SBurun (= Mabaan): *wīnankielo* "6" : *kielo* "1", *witkenāīo* "7" : *yio* "2", *witkenanrogo* "8" : *drogo* "3", *witkenangāno* "9" : *ngāno* "4"; similarly Ulu *kŏdōīnkel* "6" : *kelo* "1", *witkenukŭdŭk* "8" : *kŭduk* "3", *witkenukungŭn* "9" : *kŭngŭn* "4", but *wŭngkel* "7" : "*kelo* "1"! The Jumjum numerals 6 - 9 represent a remarkable combination of additive (6, 7) and subtractive (8, 9) principles: *dōīngel* "6" = *doi(k)* "5" + *kelo* "1", *ngŭnguk* "7" = *ngŭn* "4" + *dŭk* "3", but *wongio* "8" : *yio* "2", *wongkel* "9" : *kelo* "1". Finally, the numerals 6 - 9 in remaining languages of this group are yet incomprehensible: Kurmuk *dōgu* "6" = *nŭ-dōs* "5" + ?, *ngŭngtugei* "7" = *ngŭn* "4" + ?, *sũndök* "8" = ? + *ngŭ-dŭk* "3", *wongedun* "9" = ? + *ngŭn* "4" (?); Mughaia *derguk* "6", *ngŭntungkel* "7" : *akel* "1" ?, *bīdīa* "8" (cf. Dinka *bêd* "8" ?), *wŭngakēla* "9" : *akel* "1".

The S+ENilotic (and SESurma) numerals 6 - 9 are not derivable from lower numerals (with certain exceptions); on the other hand, their similarity to East Cushitic counterparts is suggestive:

	South Nilotic (Rottland)		East Nilotic	SESurma	East Cushitic: Sam
	Proto-Kalenjin	Common-Datooga	(Vossen)	(Haberland)	(Heine)
6	**lɔ*	**la*	TeMa **ɪllɛ*	**ille*	**liħ*
7	**tɪsɑp*	**isub*	NMaa *sapa*	**issaba(i)*	**tVzzoba*
8	**sisiit*		Maa *isiet*	**isseet*	**sizyeet*
9	**sakaal*	**šageeš*	Maa *sa(a)l*	**sakal*	**saagal*

An East Cushitic source (probably several sources) is also evident for tens and hundred:

10	**tɑmɑn*		**-tomon*	**tomon*	**tomm'an*
20	**tiptem*	**digdam*	Maa *tikitam*	SE: Mursi *tidam* SW: Didinga *itumwa*	Oromo *digdama*
30	**sosom*		Maa *ɔsPm*		**sozzom*
40	**ɑrtɑm*		Maa *artam*		**'afartam*
50	**kɔnɔm*	-	Maa *ɔnɔm*		**kontom*
100	**pɔqɔl*	**boqal*	Maa *iip*		**boqal* ECush **d'ibb-*

Heine, Rottland & Vossen (1979: 82) explain the striking similarities between SNilotic and ECushitic (Proto-Sam) numerals 6 - 10, 30, 40, 50, 100, assuming an absorption of a hypothetical Omo-Tana population (designated *Baz* according to the name of the Lake Turkana) by Southern Nilotes. The Maa counterparts should have been transmitted via Southern Nilotic (ibid. 85). In Maa, there are also parallel own numerals: *oopišana* m. / *naapišana* f. "7" (in older records with *-b-*) is apparently derived from *óbô* m. / *nábô* f. "1", i.e. 7 = [6] + 1. For "9" Maa uses still two unborrowed forms: *ooudo* m. / *naaudo* f. (Tu) and *endurùj* (Erhardt). On the other hand, the donor-language of the numeral "20" (and probably "100") is different from the source of the other numerals. It could be a language of the Oromoid type. Let us mention that the Oromo numeral "20" is isolated and unanalyzable within East Cushitic, but intelligible assuming its Nilo-Saharan origin, cf. WSaharan: Kashirda (Lk) *dígidəm*, Tubu (Carbou) *digidom* "20" etc. and further Gaam (Ma) *diag*, (BeAy) *ḍáag* "2" etc. (cf. Blažek 1997: 163). The SESurma parallels resemble so strikingly their Maa counterparts that their common donor-language seems to be very probable.

10.1. SNilotic **taman*, ENilotic (without Bari) **tɔmɔn*, correspond to Lango (CR) *tomon* "10", isolated within the WNilotic languages. There are numerous parallels in other Nilo-Saharan branches and even in some Congo-Kordofanian languages: SESurma (Hb): Yidenit *tómmo*, Meqen *tommon*, Bodi *tómmo(na)*, Mursi *(a)tómmon* // Nubian: Nobiin *dimé*, Kenzi *dimin*, Haraza *timinah*, Birgid *tummun*, Meidob *tɪmizɪ* // Kuliak: Ik *tomɪn*^{a} // Bertha: Fadashi & Mayu (TB) *ma-θuma*, Fazoglo (Tt) *ma-doma* // Saharan: Zaghawa (MM) *timm(i)*, all "10", besides the compounded forms attested in Koman: Fungi (MM) *diman-didin* "9" = "10 - 1", cf. *didian* "1", Gule (Se) *dĕmadídin* "9" : *dĕdín* "1". The primary meaning could be "all together", deducing from the semantics of the following forms which are probably related:
(i) Gaam (BeAy) *tə̀mə̀n* = (Ma) *tamann*, Hamej (Me) *tŭm* "1" = "unit" = "all together"?; cf. also Gumuz (Be): Sai *metam*, Gojjam *metaa(m)* "1" (Bender 1996: 130, #301).
(ii) Kadu (Sch): Mudo (= Tulishi) *t̪úmmu*, Yegang (= Keiga) *dúmmu̱* etc. "5" = "all [fingers of one hand]"?;
(iii) Nubian: Meidob *tuma*, Dair *tuaŋ* // Maba *dum* // Kunama *tumma*, Ilit *tumme* "all" (Greenberg 1963: 117, 133). Following A. Kaye, Bender (1996: 177) prefers to see in these words Arabic borrowings.
Gregersen (1972: 87, #70) found suggestive parallels in Mande family (Niger-Congo): Soninke *tamu*, Bozo of Sorogo *tyemi*, Bambara *tan*, Vai *taŋ* etc. (Mukarovsky 1971: 143). Is it a common heritage from the Congo-Saharan proto-language or a result of cultural diffusion?
There are also remarkable parallels in Cushitic: Beja *tamin / tamun* "10" // Agaw **-täŋa* "-ty" // ECushitic **tam(ma)n-* (> Omotic **tamm-*) "10". The question who borrowed from whom is also legitimate here.

10.2. Dinka *thyaar*, older *wtyar*, and Lw **a-paar* "10" are probably derivable from a common protoform **btyar* < **bat* "hand" & **(a)riou* "2", parallel with **bdyec* < **bat* & **dek* "1" (5.3).

10.3. Bari (Sp) *pwök*, by CR also *fwök*, "10", is isolated within both ENilotic and Nilotic at all. Blench (1992, ms.) compared it with CSudanic forms (all Sa): Kresh, Dongo, Aja, Yulu *kpúu*, cf. also Banda (Sa) *múrɔ́-fu* "10" and further with Congo-Kordofan counterparts:
Kordofanian (Me): Tegele *fungn*, Rashad *fúuńĕn* "10";
WAtlantic: Wolof (Mi) *fuka*, Konyagi (Mi) *ipoge*, Landuma (Ko) *puu* etc. // Mande: Loko *kepu*, Mende *púu*, Loma *puugɔ*, Yaure, Samo of Toma *fu*, Bobo *fun*, Guro *vu* etc. (Mukarovsky 1971: 143) // Gur: Tamprussi *fi*, Mossi *piga*, Gurma *pigea* etc. // Adamawa: Jen *fwia*, Munga *fu*, Yungur *pu*, Mbum *bu* etc. // Ubangi: Gbaya *bu(a)*, *buko*, Viri *bo*, etc. // SCNiger-Congo: Togo remnant lgs.: Tiv *puwə*; Likpe *fu* etc. (Greenberg 1963: 22, #44).

10.4. According to Spagnolo (1933: 73) Bari *mɛrɛ (gɛlɛŋ)* "10 (one)" originally meant "one mountain". But there are suggestive parallels in other Nilo-Saharan branches meaning "10":
Taman (Ed): Tama *merr*, Erenga *mer*, Sungor *mɛ̀r*, Miisiiri *martik* ("10 x 1" - see 1.2) // Saharan: Tubu (Nachtigal) *múro* "10", Tubu of Kashirda (Lk) *múrdɔm* "10" vs. *dígidəm* "20", Berti (MM) *mussaŋ* "10", *mussu* "20" vs. *saŋ* "1" & *su* "2" respectively, implying **muC-* "10" where **C* could represent **-r-* before assimilation to *-s-* // Proto-Nubian **[m]uri* > Hill Nubian **bure* "10" > Kadaru (Tl) *boɽe*, Dair (Junker-Czermak) *buuré*, Kundugr (Hess) *bụrẹ* (Hill Nubian **b* can reflect older **m*, cf. Hill Nubian **beli* vs. Nile Nubian **milli* and Birgid *mattana* "bad" < Proto-

Nubian **maldi* - see Bechhaus-Gerst 1984: 74) // Kuliak: So (Carlin) ***mɪmɪr*** "10" // ? CSud: Lugbara (Tu) *mɛrí-ìrí* "20" : *írì* "2" (is it possible to identify the first component with *mudŕ* "10" ?), besides Banda *múrɔ́-fu* "10" (cf. 10.3).

A primary semantic motivation could be based on the meanings (i) "fingers", (ii) "all / many", attested as follows (cf. Blažek 1997: 167):

(i) Nilotic **mɔr* "finger" (Dimmendaal 1988: 41, #65) > SNilotic ****mɔɔrɪn*** // ENilotic: Bari *mɔrɪn*;

(ii) NWNilotic: Jumjum (Be) *mɔreen* "all" // SESurma (Be): Mursi *mɛrì*, Tirma *meeri*, Meqen *mɛri* "many" // Gumuz: Sese (Be) *mara*, *məʼra* "very" (Bender 1996: 101, #149).

10.5. WNilotic: Burun (EP) **(a)cāī* "10" > Jumjum *cai*, Mughaia *cāī*, Kurmuk *asāī*, Ulu *kŏ sāī* (in Ulu the prefix *kŏ-/kŭ-* forms the numerals 2, 3, 4, 5, 10) can be related (i) to Maban: Mimi (Nachtigal) *sáya* "10" // Daju (Tl) **asiɲ* "10"; perhaps Bertha: Bertat (Ma) *assing* "5" and Koman: Kwama (Be) *ašiin* "all" // Fur (Me) *soŋa* id., maybe also Saharan: Berti *saaŋ* "1" : *mussaŋ* "10" < **mu*[*r*]*-saŋ* "10 x 1", or (ii) to SSurma (Be): Zilmamu *aši*, Mursi *síiò*, Tirma *sino* "hand" (cf. WNilotic **ci(i)N* "hand" ?) // Gaam (Be) *ʼas* id.

10.6.-10.7. The isolated forms for "10" in Nuer (WNilotic), viz. (i) *wúä́äl* (Crazzolara) = *wâl* (We) = *wal* (Huffman), and (ii) *jyáaṯ(n)kɛ̀ɛl* (Crazzolara), mean originally "plant" and "tree (one)" respectively (Crazzolara 1933: 57-58).

10.8. SNilotic: Common Datooga **muquš* "10", isolated within Nilotic, resembles the numeral "5" in Gumuz (Be): Sese *məkʼús*, Sai *mɛkus*, Gojjam *ma(n)kus* and in Bertha: Fadashi *ma-kuusu*, Qamamyl *mu-kušu*. The different meanings are compatible, but this difference should be explained.

Conclusion:

The Nilotic numerals with more or less promising cognates in Nilo-Saharan and further in Kordofanian and Niger-Congo macro-phyla, including the parallels which do not correspond exactly in semantics, can be summarized in the following table:

	1.1.	1.2.	1.3.	2.1.	3.1.	3.2.	4.1.	5.1.	5.2.	10.1.	10.3.	10.4.	10.5.	10.8.
Surma	a			2		3	4		1	10				
Daju								5					10	
Nuba M.				2										
Bertha		1		7	3?		4			10			5?	5?
Jebel		6			3?		4?			1				
Taman	1	10		2								10		
Nubian		5?		2,20	i,8?							10		
Nara		1		2,7				5?						
Maban		1,10		7?									10	
For	b	1		2			4						a?	
CSudanic	1	10?		2	3?	3		5	h		10	10		
Gumuz						3								5?
Koman		6				3?	4	5		9			a?	
Kadu		1		2		3?				5				
Kuliak			c		3?	3	4		1	10		10		
Songhay				d										
Saharan				6,7,e,f						10		10	1	
Kunama	1?			b					5,g					
Kordofanian		1			3?		4				10			
Niger-Congo	1	1		2?	3?		4		g	10	10			

a = all, b = (an)other, c = alone, d = twin, e = half, f = foreign, g = hand, h = fingernail, claw, i = middle / third finger.

The most promising protoforms of Nilo-Saharan numerals continuing in the Nilotic languages, sometimes supported by external, i.e. Congo-Kordofanian, data, can be 'impressionistically' reconstructed as follows:

1.1. **(k-)ila* or **(ku-)ila*
1.2. **dhiku*
2.1. **ariw*
3.1. **Vda*[*k*]
3.2. **(k-)uni*
4.1. **ŋwal* < **ŋalu*
5.1. **(m-)wit*
5.2. **kwan* < **kanu*
10.1. **tuman*
10.3. **poku*
10.4. **muri*

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MOTHER TONGUE
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In Memory of Daniel F. McCall

Basque and the Other Mediterranean Languages

John D. Bengtson
Association for the Study of Language in Prehistory

Dan McCall, the honoree of this issue, was deeply interested in the world around him. I did not get to know him very well, since I only saw him at ASLIP meetings and conferences, but Dan's keen curiosity about the myriad details of life, and appreciation of the patterns we find running through them, were palpable, and expressed with humility and wonderment, without any hint of bombast or pedantry.[1]

In 1994 Dan and his friend Hal Fleming co-authored an article in the *Mother Tongue* (Newsletter) about the ancient languages of the Mediterranean area, including Basque and other ancient languages of Iberia. In it Dan and Hal discussed the competing hypotheses relating the Basque language to Caucasian languages on the one hand, and Afro-Asiatic (Afrasian) tongues on the other. I hope that my essay below will help to bring us closer to answering these questions.

* * *

Václav Blažek (1991, 1992) tackled this question in his characteristically analytical method, citing 30 Basque words that, seemingly, have equally good lexical parallels in Caucasian and Afro-Asiatic (AA). He concluded with comments on eight "more or less probable hypotheses":

1. A common [and immediate] genetic unity of Basque, Caucasian and AA.
2. A distant genetic relationship of Nostratic (incl. AA) and Sino-Caucasian (incl. Caucasian and Basque).
3. Basque is [immediately] related to Caucasian.
4. Basque is [immediately] related to AA.
5. Basque and Caucasian (or the hypothetical Mediterranean substratum related to them) influenced AA before its disintegration.
6. AA influenced Basque and Caucasian before their disintegration.
7. Basque (related to Caucasian) influenced Berber.
8. Berber influenced Basque.

Blažek tentatively concluded that options 2 and 3 were most probable at a greater time depth, and consequently options 5 and/or 6, but also that a definitive solution was far away.

So how do we decide among these possibilities? After working on this problem for decades, I can only offer my "best explanation" (Bengtson 2008c) based on a balanced assessment of morphological, lexical, and phonological evidence. Here, as elsewhere, I follow the classical methods of comparative linguistics, in which one carefully investigates the morphology and lexis of a language, or group of languages, and looks for diagnostic patterns that link languages within a genetic group. When working with a relatively young family, like Slavic or Bantu or Malayo-Polynesian, this is quite easy for a minimally trained linguist, and even a fairly well-educated person with no linguistic schooling can detect some of the lexical and grammatical features that distinguish these families. When the time depth is greater it is necessary to employ some special tools that have been developed by paleolinguists over the centuries. Here I shall briefly summarize these methods as I understand them.

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[1] A perusal of Dan's memoir *One Thing Leads to Another*, mentioned in this issue's Book Notices, will help the reader understand the background and development of this remarkable man's mind. See also Hal Fleming's tribute in this issue, pp. 1-4.

Morphology or *grammar* is the backbone of any language (except in some regions where isolating structures have developed). Thus, wherever possible, a careful comparison of morphological structures should be made, looking for cognate markers and especially for common patterns or paradigms. When the probable time depth is great one might only find fossilized remnants of paradigms (see below).

With *lexis* or vocabulary the work is also harder at greater time depths. Here we can turn to lists of the most basic lexical meanings, such as the well-known "Swadesh lists" (100-word and 200-word). To sharpen the focus even more we can use the shorter "Dolgopolsky list" and "Yakhontov list" (see below). The point is not that such words can never be borrowed – they can – but the chances of finding genuinely old words increases with the use of such lists.

The third dimension, *phonology*, can only be applied after genetic relationship is already verified by morphology and lexis. When we are confident that we have a substantial corpus of basic etymologies and a grammatical structure to hang them on, so to speak, we can then analyze the lexical material and abstract a phonological structure or system. If the elements of the phonological system of our language shows regular correspondences with those of another language, or language family, we can assume a greater probability that the systems are genetically related.

I will now apply these criteria of the genetic classification of Basque and the question of whether Basque is closer to Afro-Asiatic or Caucasian:

Morphology: On several counts the morphology of Basque is more consistent with Caucasian than with Afro-Asiatic. In nominal morphology there is no trace in Basque of the AA two-gender system with *-(a)t* as a marker of the feminine gender.[2] There is no grammatical gender at all in present-day Basque, but I have proposed that the existence of some apparent fossilized prefixes (**i-/e-*, **u-/o-*, **bi-/be-*,[3] and perhaps others) bear witness to an earlier multi-gender/class system, and the prefixes appear to correlate with the Caucasian class markers **i-/j-*, **u-/u̯-*, **w-/b-*, etc. (see MCG, pp. 81-88).

While Afro-Asiatic noun case endings are typically simple and vocalic (basically alternations of the vowels *a ~ u ~ i*),[4] the Basque case endings (ergative **-k*, dative **-i*, instrumental **-s* [orthographic *–z*], genitive **-n*, allative **-r/la*, etc.) are phonetically different from those of AA, but they have promising parallels in Caucasian, Burushaski, and Yeniseian (MCG 90-92). Additionally, Basque has compound case endings such as the directional ending **-(r)anc* as in **mendi-ranc* (UB *mendirantz*) 'towards the mountain' < **-ra-* + **-nc-*. Compound case endings are also common in Caucasian and Burushaski (MCG 92). I have also proposed that some Basque allomorphs can be explained as stem + fossilized oblique stem markers, with analogs in Caucasian (MCG 89-90):

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[2] Hayward (2000: 94).

[3] Each pair of prefixes appears to constitute allomorphs of the same original prefix, each with high (*i, u*) and mid (*e, o*) alternant.

[4] Hayward (2000: 88-90). V. Blažek (p.c.) cautions: "I would add only that the AA nominal declension was richer than the *-u/-i/-a* model reflected by Classical Arabic." For example, there is an **-s* suffix (dative?) attested widely in Afro-Asiatic (Blažek 2006).

Bsq **śu* 'fire' / **śu-**t**-argi* 'firelight' : cf. Hunzib *azu* 'summer' / gen. *az-**du**-s*
Bsq **oihan* 'forest' / **oiha-**r**-bide* 'forest road': cf. Hunzib *ƛ́i* 'malt' / gen. *ƛ́i-**ro**-s*

Number (pluralizing) is entirely different in Afro-Asiatic vs. Basque. There is no trace in Basque of the characteristic "broken" or ablaut plurals of AA.[5] In Basque a suffix (*-Vk*) is added to the entire noun phrase, e.g. *lau gizon hauek* 'these four men' (*lau* '4', *gizon* 'man', *hau* 'this').[6]

The most basic Basque pronouns, such as 1sg **ni* / 2sg **hi*, are quite unlike their PAA counterparts, (subject case) 1sg **ʔaku* / 2sg **ta* (m.), **ti* (f.).[7] There is a purely typological similarity in that both Basque and PAA distinguish the sex of the addressee, in Basque only in the verbal agreement suffixes (**-ga* m. / *-*na* f.), but a similar distinction is also found in West Caucasian, and in all three families the lexemes forming the pronouns are entirely different. This peculiarity, along with some lexical parallels (see below) may be attributed to a period of *Sprachbund* contact involving the ancestors of all these languages in the general region of southern Anatolia and/or northern Levant.

In verbal morphology the differences between Basque and Afro-Asiatic are also quite marked. Such typical AA features as internal ablaut and consonant gemination[8] are entirely lacking in Basque. Like AA, Basque has a kind of "prefix conjugation,"[9] but the prefixes in each family are entirely different:

	Afro-Asiatic[10]		**Basque**
	Arabic 'write' (impf.)	Arbore 'come' (impf.)	'come' (pres.)[11]
1sg	**ʔ**-aktub-u	**ʔ**-aačč-a	**n**-ator
2sg	**t**-aktub-u (m.)	**t**-aačč-a	**h**-ator
3sg m.	**y**-aktub-u	**y**-aačč-a	**d**-ator
3sg f.	**t**-aktub-u	**t**-aačč-a	
1pl	**n**-aktub-u	**n**-aačč-a	**g**-ato-z

In the above paradigms the only similarity might seem to be the 3sg prefixes AA **t-* ~ Bsq **d-*. However, as mentioned above AA **t* is specifically feminine, while Bsq **d-* is gender-neutral.

Lexis: As pointed out by Blažek (1991, 1992) and others before him (Gabelentz, Mukarovsky, Trombetti, Woelfel, et al.) there are some interesting lexical parallels shared by Basque and AA languages. However, upon some investigation most if not all of them can be ascribed to the following categories: **(a)** specific resemblances to particular AA languages, pointing to contact and borrowing (= Blažek's "hypotheses 5 & 6") rather than common genetic origin, **(b)** very old words common to AA and Basque (and Dene-Caucasian), and often to other macro-families as well (some of the evidence for Hal Fleming's Borean = Blažek's "hypothesis 2"), and **(c)** chance resemblances.

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[5] Diakonoff (1988: 65-66); Hayward (2000: 92).

[6] Trask (1997: 89-90).

[7] Blažek (1995: 37). The Bsq pronouns are more similar to the Chadic "Set A" pronouns 1sg **ʔan-i* / 2sg **ka(y)* (m.), **ki(m)* (f.) (ibid.), but then one would have to suppose a special closeness between Bsq and Chadic, which is not borne out by other lexical or morphological (or any historical) evidence.

[8] Hayward (2000: 91), following J.H. Greenberg.

[9] Hayward (2000: 90). Basque verbal morphology is mainly periphrastic, and the "synthetic conjugation" shown here is still used for only a small number of verbs (Trask 1997: 103-109, etc.). Nevertheless, the synthetic conjugation clearly reflects the ancient state of affairs.

[10] Hayward (2000: 90).

[11] Trask (1997: 108, 281-223, etc.). The root cited here is **-tor̄-* 'to come', participle **e-tor̄i*. *–z* is a pluralizer.

For examples of **(a)**, consider Bsq **nahaśi* 'to mix, confuse, agitate', compared by Trombetti (1926) with Coptic *nehse, nehsi* 'to (a)wake(n), excite' < Ancient Egypt. *n h z ỵ* 'erwachen, wach sein, aufwecken'.[12] Bsq **nahaśi* does not have a typical Bsq verb-root structure, the latter being more spare or syncopated (e.g. Bsq **e-akin* 'to know', **e-ar̄i* 'to set', **e-bili* 'to walk', with one or two consonants); triconsonantal verb roots are typical of Afro-Asiatic, at least in its later stages (Diakonoff 1988: p. 42ff.). There are no known Dene-Caucasian cognates of Bsq **nahaśi*, and there is a close phonetic and semantic similarity with the Coptic words. Likewise with Bsq **saspi* 'seven' ~ Coptic (Sahidic) *sašfe* 'seven' (fem.) < Anc. Egypt. *s f x w*.[13] These words attest to contact with a specific branch of AA, Egyptian, and the word for 'seven' in particular, with the change of *x* > *š*, fixes the time of contact to a late Egyptian period around the time of the Roman empire.[14] On the other hand Basque **naguśi* 'boss, chief', etc. looks very Semitic: cf. Ge'ez *nigūś*, Amharic *nigūs* 'king, emperor';[15] Hebrew *nōgēś* 'taskmaster, oppressor', etc. (MDELV VII: 954). Contact with Semites is possible if the linguistic ancestors of the Basques came from Anatolia, as proposed later in this paper.

In category **(b)** I suggest similarities such as Bsq **agor̄,* 'dry' / **egar̄i* 'thirst' ~ Berber: Ahaggar *iġar / eḳḳar* 'to be dry', etc.[16] The Basque words have Dene-Caucasian cognates (PNC **=iɢ̱wĂr,* PY **qɔ(ʔ)rɪ-,* PST **kār* 'dry'), and the Berber words have widespread AA cognates (reconstructed as PAA **ḳVr-* = **k̓Vr-* 'dry', according to TOB), that in turn have cognates in Altaic **k'i̯óbarV* 'dry' and Uralic **kujwa* 'dry' (per TOB). This 'dry', then, would qualify as a "Borean" cognate, and thus too widespread to be evidence for a close relationship between Basque and Berber. A similar example is Basque **guti* 'few, a little' ~ Berber: Ghadames *iktu* 'few', Zayan *keṭṭin* 'to be small, short', etc.[17] Again the Basque word has good Dene-Caucasian cognates (e.g. Lezgi *güt'ü* 'narrow', Dargi Kaitag *kut'i*-l 'short'),[18] and similar words are widespread in "Borean" (e.g. Dravidian **guḍ-* 'small': TOB).[19]

Let us see what happens if we focus on the most basic of the words that are cited as diagnostic for AA.

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[12] Coptic and Egyptian forms after Vycichl (1983). Cf. MDELV VII: 952.

[13] Trask (1995: 69) has ridiculed this comparison, but some other linguists that I respect have agreed with the idea that a simple borrowing between two Mediterranean languages seems far more likely than a "coincidental" match of five sequential phoneme-types (roughly, SASPE) with the exact same meaning. (Note that the Vasco-Iberian domain formerly extended to the Mediterranean coast.)

[14] V. Blažek, p.c. The specific avenue of contact (Egyptian colony in Iberia?) remains to be determined.

[15] *Negus*, one of the titles of Haile Selassie I, as well as of other lesser rulers.

[16] Comparisons by Gabelentz and Woelfel, cited by Blažek (1992: 24).

[17] Comparison by Trombetti (1926), cited also by Blažek (1992).

[18] PNC **kHə̄ṭwV̄ / *kwHə̄ṭV̄* 'short' (NCED 690-691).

[19] There was a discussion thread on MTLR earlier this year (2010) in which Michel Morvan compared Bsq *guti* with an Austronesian word (cf. Proto-Austronesian **kedi* > Paiwan *keḍi*, Waray-Waray *guti* 'small', etc.). Cf. http://language.psy.auckland.ac.nz/austronesian/

	PAA[20]	Basque	Caucasian	other DC
blood	***ʒam(ʔ)-**[21]	***o-dol**	?	PST **t(h)ălH* 'flesh' PAE **dəɫ* 'blood'
bone	***k̓(ʷ)as-**[22]	***ɦe(n)sur̄**	PEC **mswɨ̄re* 'rib, side'[23]	
tongue	***lis-**[24]	***minhi**[25]	PNC **mĕlc̣ĭ*	Burushaski *jú-*mus-*
tooth	***sin-**[26]	***horc**	Lak *k:arč:i*	< PDC **kVrǯwV*
horn	***k̓ar-**[27]	***a-dar̄**[28]	Avar *ƛ:ar = tɬ:ar*	Burushaski **-ltúr*

No words are totally immune to borrowing or replacement, but some are demonstrably more stable than others, and body part terms make up the majority of such words.[29] It is clear that when we examine the most basic and stable words there is little or no resemblance between AA and Basque, while Caucasian (and other Dene-Caucasian languages) show several promising matches with Basque.

The problem can be viewed from a different angle. Some years ago I remarked that the words for 'eye', 'ear', and 'tongue', three major organs of the head, tend to have parallel forms in many languages (Bengtson 1999). Take note of the finals in each trio:

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[20] Afro-Asiatic is a very old family, and its vocabulary is very diverse. These "PAA" proto-forms are based on attestation in at least two of the major branches (Semitic, Berber, Egyptian, Chadic, Cushitic, Omotic).

[21] Om + Chad + Ber + Eg + Sem: Blažek (2008: 97, no. 9.2).; TOB distinguishes PAA **ʒam(ʔ)* (Sem + Om) from PAA **ǯin-* (Ber + Eg + Chad). Cf. also PAA **dam-* Sem + Ber + Chad (+ Om?) 'blood'.

[22] Om + Cush + Chad + Ber + Sem + Eg (TOB; Blažek 2008: 97-98).

[23] Found only in Lak and Lezgian (NCED 954). The cited reconstruction **rɨ̄mswe* fits Lak *niws* 'rib' and Archi *bars:on* id. < **wars:wɨ-n*, but the other Lezgian words imply PL **s:wɨra* < PEC **mswɨ̄re*; PEC has the odd cluster **msw-* also in **mswänV̆* 'place' (NCED 833). The meaning 'rib' in the outlying languages Lak and Archi suggests that they retain the original meaning, with shifts to 'side' > 'part' > 'half' in the other Lezgian languages. The initial **ɦ* in Bsq (based on BNav. and Lap. *hezur*) is difficult to match with PEC **mswɨ̄re,* though perhaps the long vowel **mswɨ̄re* < **mswɨHre*.

[24] Sem + Ber + Eg + Chad. A different root for 'tongue' is Om (**alib-*) + Cush (*ʻ/ʼ*anrab-*) + Chad (*ariangu*, etc.): Blažek (2008: 131-132, no. 89.3); Fleming (2006: 111, 144).

[25] This is my modification of Michelena-Trask's **bini*, recognizing the importance of the aspirate. **binhi* would produce the same result, though in my opinion the changes **m-* > **b-* > *m-* would unnecessarily multiply the entities (Ockham), the same point made by Starostin (1996). Jacobsen (1995: 133) supports the reconstruction **mini*, but in my opinion this can still be improved upon in order to account for the clear /h/ in northern Basque, and especially the strong fricative /ç/ heard in Baïgorry [mihçja] *mihia* 'the tongue' by Moutard (1975). Likewise [behçja] *behia* 'the cow', and others.

[26] Om + Chad + Ber + Sem (+ Eg?): Blažek (2008: 132, no. 90.4). TOB includes SCush **siḥin-* < **ḥV-sin-*?

[27] TOB Sem + Eg + Om, though Blažek (2008: 112, no. 41.4) regards the Omotic words as borrowed from Ethio-Semitic.

[28] The proposed development of **adar̄* < **a-rdar̄* by dissimilation is explained, with more examples, in Bengtson (2004: 40).

[29] For example, Fleming (2006: 144) cites 'eye, ear, nose, mouth, tooth, tongue, head, hair, bone, hand, knee, foot, belly, heart, blood' as "conservative words." S.Y. Yakhontov's list of 35 most stable words, as cited by Starostin (1996b: 121) includes 8 of Fleming's 15: 'blood, bone, ear, eye, hand, nose, tongue, tooth', plus other *body parts* 'egg, horn, tail', the basic *verbs and descriptives* 'die, full, give, know, new', *pronouns* 'I, this, thou, what, who', *numerals* 'one, two', *nature words* 'dog, fire, fish, louse, moon, salt, stone, sun, water, wind', and 'name, year'.

	Gothic	Lithuanian	Mongolian	Hebrew
eye	augō	akìs	nidün	ʕayin
ear	ausō	aušìs	cikin	ʔōzän
tongue	tuŋgō	ležúvis	kelen	lāšōn

‘Eye’ and ‘tongue’ “are two of the six most conservative items we know of,”[30] and ‘ear’ should figure as nearly as basic. In Basque all three are formed with the stem-vowel *-i*: ***begi*** ‘eye’,[31] ***be-lar̄i*** ‘ear’, ***minhi*** ‘tongue’.[32] Note similar parallelisms in East Caucasian:

	Basque	Proto-Nakh (oblique stem)	Dargi (Akushi)	PNC
eye	*b(-)egi	*bʔare-	ħuli	*ʔwĭlʔi
ear	*be-lar̄i	*lari-	liħi	*ɬĕHɬi[33]
tongue	*minhi	*maťťi-	lezmi[34]	*mĕlc̣ĭ

This demonstrates that Basque and the Caucasian languages share a lexical subset for these basic words, in which not only the stem vowels but the roots themselves are cognate and represent an innovation not shared by any other languages.[35] For a biological analogy, this lexical subset is the linguistic equivalent to the genetic markers discussed below.

Numerals: “A common Afrasian system of numerals cannot be reconstructed” (Diakonoff 1988: 67), but widespread roots for ‘two’ and ‘four’ are cited. Let us compare these with Basque and Caucasian:

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[30] Fleming (2006: 143-144), citing the work of Aharon Dolgopolsky and Paul Black. The other four of the six are the pronouns ‘I, thou, we’ and the numeral ‘two’.

[31] The phonological relationship between Bsq **begi* ‘eye’ and the Cauc words for ‘eye’ is not fully understood. The closeness in form of Bsq **begi* and Chechen-Ingush *bʕar-g* and Batsbi *bʕar-ḳ* ‘eye’ (where the final velars are diminutive suffixes) suggests that the **-gi* in Bsq could be the remnant of a diminutive suffix. The initial **b-* could be a fossilized class prefix, as in the Nakh words for ‘eye’ and Bsq **be-lar̄i* ‘ear’.

[32] According to Trombetti (1905: 105 ff.) the suffix *-i* is a primeval marker of *nomina agentis*: cf. Swahili ***m-lif-i*** ‘payor’ (*-lipa* ‘pay’), Beja ***kắtb-i*** ‘writer’, Old Indic *kav-í-* ‘wise, knowing, skilful; thinker, wise man, poet’, Gothic ***fisk-j-a*** ‘fisher’, Finnish ***anta-j-a*** ‘giver’, etc.; this *-i* figures widely in the names of sense organs (‘eye’ = ‘seer’, ‘ear’ = ‘hearer’, etc.): Tamil ***cevi*** < ****kev-i*** ‘ear’, Georgian ***q’ur-i*** ‘ear’, ***tval-i*** ‘eye’, and the Lithuanian, Basque and East Caucasian words for ‘eye, ear, tongue’ cited here.

[33] The citation in NCED is **ƛĕHƛe (~ -i),* meaning that the reconstruction **ƛĕHƛi* is equally as likely as **ƛĕHƛe*. It is also possible that the two **ƛ* in PEC **ƛĕHƛi* are the result of assimilation, and that the original was something like **ƛĕHri*. Basque **be-lar̄i* evidently contains the fossilized prefix **be-*, probably identical with the East Caucasian class marker **w-/*b-*.

[34] Metathesis < Proto-Dargi **lec:mi* ‘tongue’; the unmetathesized variant coexists in free variation in Akushi as *mez* ‘tongue’! (NCED 802). Coexistence of metathetic variants is not unusual in Caucasian: cf. Tindi free variants *ťuḱa* ~ *ḱ̓uta* ‘goat’ (NCED 1004).

[35] Burushaski shares at least two of the three words, and S.A. Starostin thought all three. The strange Bur **ltumal* ‘ear’ was derived by him from **ltul-ma*, in which the first element **ltul* corresponds to PNC **ƛĕHƛi* and Bsq **-lar̄i*. Thus Bur **-́l-ći* ‘eye’, **ltumal* ‘ear’, *-ju-*mus* ‘tongue’. For phonetic reasons only Bur lacks the final vowel **-i* (**-ći* in **-́l-ći* ‘eye’ seems to be a suffix peculiar to Bur).

	PAA	Basque	Caucasian	other DC
two	***činy-**[36]	***bi**	Udi *p:ạ,* etc. < PNC **(t)q̇Hwā̈* '2'	PY ****xɨ***-na*
four	*(ʔa-)**far-**(d-)[37]	***lau**	Ubykh *p̓X̂ə* 4 < PWC **p(:)əX̣ə* '4' PEC **bǖnL̠e* '8'	Burushaski **w-alt-* '4' PST **P-lĭy* '4'

The Dene-Caucasian structure with internal lateral and an (optional) labial prefix for the numbers 'four' and 'eight' is very characteristic. Burushaski has extended this stem to express 2 and its second and third powers: **altV́* '2' / **w-ált-* '2^2 = 4' / **altá-mb-* '2^3 = 8'. The Basque word **lau* 'four' lacks the labial prefix. So, at least for these basic numerals, Basque has much more in common with DC than with AA.

Phonology: It must be admitted at the outset that the phonological system of Basque, which is quite simple, has little obvious resemblance to the intricate phonologies of Afro-Asiatic and Caucasian. Basque lacks the trinary obstruent contrast (plain voiceless ~ ejective ~ voiced) reconstructed for both AA and Caucasian, and which can be symbolized by *T* ~ *T'* ~ *D*:[38] Basque, like most European languages, has only the binary contrast *T* ~ *D*. Both AA and Caucasian proto-languages had abundant laryngeals and pharyngeals, e.g. /ʔ h ɦ ʡ ħ ʕ/, while modern Basque has only /h/ (and even that is silent in the Spanish dialects of Basque). So on the surface there seems to be no reason to suppose Basque to be close to either of the families.

However, it is not the *similarity* of phonological systems that indicates relatedness, but *regularity of correspondence* between the systems. Thus, for a familiar example, the Celtic phonological system is quite different from that of Indic, but already in the nineteenth century it was shown that both systems can be derived by regular rules from the Proto-Indo-European system. Likewise, after finding significant resemblances in morphology and basic lexis between Basque and Caucasian (and other Dene-Caucasian languages), I proceeded to investigate whether or not there were any correspondences between the respective phonological systems. Based on an etymological corpus of several hundred comparisons,[39] I have published the results in several papers (Bengtson 2003, 2004, 2008a, 2010b). Many questions remain to be answered, but it is already clear that correspondences between the systems exist, and in general the picture is that of mergers on the side of Basque. Since Proto-Caucasian had about 48 consonant phonemes and modern Basque has about 23, this should not be surprising. The following table gives a simplified view of some of the correspondences:

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[36] Sem + Eg + Ber (Blažek 1999: 30-31).

[37] Eg + Chad + Cush + Om (Blažek 1999: 32-38).

[38] The "emphatic" series in AA (**t'*, etc.) is realized in various ways in the descendant languages: glottalized, velarized, or implosive (Diakonoff 1988: 35).

[39] The current Basque Etymological Database on TOB consists of 611 etymologies, not all of which have external cognates thus far.

Proto-Caucasian	Basque	sample etymologies[40]	
		PNC	Basque
q	**k**	***=Hīq̱V(r)** 'to pull, take out; drag, carry'	***ekar̄i** 'to bring, produce', etc.
q̓		***q̱ī̆dV** 'soot, dust'	***kedar̄** 'soot'
k̓		***ḵwɨ̆nħV** 'smoke'	***(e-)kee** 'smoke'
k	**h**	***kiłū** 'farmstead, hut'	***huri** 'village, town'
x		***xwɨ̆mc̭wɨ̄** 'marsh, bog'	***i-hinc** 'dew'
χ		***χāłV** 'thread, sinew'	***ha[l]i** 'thread, wire'
h		***h[ă]łʔa** 'steam, breath'	***haro** 'weather, season'
ɦ		***ɦwə̄rq̱ē** 'ridge; boundary'	***hegi** 'ridge, border', etc.

In my model these particular eight PNC phonemes correspond to only two in Basque.

An important part of the Proto-Caucasian (and Proto-Dene-Caucasian) phonological system was a rich array of laterals: the affricates **ƛ, *ƛ̣, *Ł,*[41] the voiceless fricative **λ*, and the resonants **l* and **ł*.[42] If Basque is related to Caucasian, there would have to be clear correspondences to the laterals. My research into this has revealed some very interesting patterns.

In non-medial positions (initial and final position) all six PNC laterals correspond with the lone Basque lateral, resonant /l/. One example of each is shown here (extensive examples are cited in MCG and Bengtson 2004):[43]

[resonant **l*] PNC **lhĕmŁ̱wĭ* 'earth, ground'	~ Bsq **lur̄* 'earth, ground'[44]
[resonant **ł*] PEC **łamV* 'licking; to lick'	~ Bsq **lami*-ka- 'to lick'
[fricative **λ*] PEC **λ̱wirdɨ* 'manure; pus'	~ Bsq **lirdi* 'drivel, saliva'
[affricate **ƛ*] PEC **ƛ̱HwemV* 'liquid' (adj.)	~ Bsq **limuri* 'moist, humid, slippery', etc.
[affricate **ƛ̣*] PNC **ƛ̣wɨ̆rHV* 'leaf'	~ Bsq **lahar̄* 'creeping plant, bramble'
[affricate **Ł*] PNC **Ł̱ŏli* 'color, skin'	~ Bsq **lar̄u* 'skin, hide, leather'

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[40] Each correspondence is based on multiple etymologies. The details (attested Basque and Caucasian words) are found in MCG and/or in the Basque Etymological Database on TOB.

[41] The lateral affricates **ƛ, *ƛ̣, *Ł* (in Nikolaev & Starostin's transcription) may also be represented as /t^{l}/, /t^{l}'/, /d^{l}/, respectively. In some parts of East Caucasian they are *velarized*, thus more like /k^{l}/, /k^{l}'/, /g^{l}/, respectively. They are clearly to be analyzed as unit phonemes, not clusters.

[42] The exact phonetic value of PNC **ł* is uncertain. It may have been a back (velar) lateral.

[43] There are fewer examples of the final reflex **-l*. See Bengtson (2004-40-41) for some of them.

[44] Assimilation and/or dissimilation has apparently taken place on one side or both.

In medial position we find a multiplicity of Basque reflexes. In general, PNC **l* and **ł* correspond to Bsq *-*r*-, PNC *λ to Bsq *-*lh*-, and all three PNC lateral affricates correspond to the clusters *-*rd*- or *-*rt*-:[45]

[resonant **l*]	PNC **q̇ĕħlV* 'bitter'	~ Bsq **kerać* 'bitter, sour, stench, stink'
[resonant **ł*]	PEC **χ̱āłV* 'thread, sinew'	~ Bsq **hari* / **hal*- 'thread, wire'[46]
[fricative *λ]	PEC **λwɨndV* 'firewood, wood'	~ Bsq **i-lhenti* 'firebrand, ember'
[affricate *ƛ]	PNC *=*ăƛ̱wVn* 'to resemble, similar'	~ Bsq **b-ardin* 'the same, equal, even,' etc.[47]
[affricate *ƛ̣]	PNC *=*ĕƛ̱Ĕ* 'middle, half'	~ Bsq **erdi* 'middle, half'
[affricate *Ł]	PNC **ć̣āŁwV* 'blood; life'	~ Bsq **i-särdi* 'sweat, sap'[48]

The Basque intervocalic development of lateral affricates, which may be symbolized as TL > RT, is parallel with the Burushaski development symbolized as TL > LT, for example Bur. **jult* 'time, right moment', corresponding to Bsq **ordu* 'time, hour, occasion'; Bur. *-*múltur* 'nostril' corresponding to Bsq **muturˉ* < **murturˉ* 'snout, muzzle', etc.

The "Chronological Problem"

Some of the resistance (perhaps indeed, *most* of the resistance) to accepting demonstrable relationships between Basque and other languages is the assumption by many that the Basque language as we know it is a lineal descendant of the language spoken by the original Upper Paleolithic (Aurignacian, etc.) settlers of Iberia and Aquitania some thirty millennia ago. If this were so, one would hardly expect to find recognizable lexical or grammatical cognates between Basque and any other language, or at least not to the extent claimed by me in these pages.

I suggest instead that there is no reason to assume uncritically that the Basque language has to represent an unbroken tradition since Paleolithic times. We know of many documented examples of language replacement, for example in the Middle East, where many local languages (Sumerian, Semitic and other) were overlaid first by Aramaic and later by Arabic. In Europe many languages were submerged by Latin in a similar way, and so on. On Basque I follow no less an authority than the great vasconist René Lafon,[49] who posited that the people of the Basque Country and Aquitania adopted a foreign language from an immigrant population who brought a technologically superior culture.[50]

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[45] These clusters are realized phonetically in Bsq as [r̄ð] and [r̄t], respectively, with a strong trilled rhotic (Hualde 1991). For more examples of the *-*rt*- reflex, as well as *-*rd*-, see Bengtson (2004: 40).

[46] Bsq **hari* has a stem variant **hal*-, as in **haliko* 'ball of string', betraying the lateral origin of this /r/. Several other Bsq words show this kind of alternation (MCG 75).

[47] The initial **b*- appears to be a fossilized class marker, seen also in other adjectives and adverbs like **b-arda* 'last night', **b-ehe* 'below', as well as in nouns: **be-lar̄i* 'ear', **be-ldur̄* 'fear', and many others.

[48] For the semantics, cf. Old English *swǣtan* 'to sweat, to bleed', likewise in other old Germanic languages: Old Icel. *sveiti* 'sweat, blood', etc.

[49] Even Trask (1997: 55, 65, etc.) praised Lafon as a "distinguished vasconist" who was "cautious almost to a fault" and who analyzed Basque with "clarity and scrupulousness." Lafon differed from Trask and Michelena in that he accepted the relationship of Basque with Caucasian, though he did not separate Kartvelian from (North) Caucasian: "La parenté du basque et des langues caucasiques . . . peut être aujourd'hui tenue pour certaine" (Lafon 1949: 200).

[50] "La langue basque n'est pas une langue indigène, autochthone; c'est une langue d'origine étrangère, d'adoption . . . d'une civilisation supériore par certains côtés à la leur propre . . ." (Lafon 1949: 206).

Lafon identified this culture with copper-using, megalith-building immigrants near the end of the third millennium BCE.[51] After conferring with an archeologist colleague, Peter Rowley-Conwy, I agree with the latter that a likelier candidate is the much earlier Cardial Culture, which arrived on the eastern Spanish coast around 5500 BCE.[52] Recent archeological evidence suggests that the Cardial people, originally from Anatolia, arrived by boat from Italy by means of 'leapfrog' colonization round the South French coast. The name Cardial refers to *Cardium edulis*, a mollusk whose shells imprinted their clay artifacts. Besides the characteristic ceramics, the Cardial Culture included what the archeologists call a complete "Neolithic package" of cultural traits, including the use of domesticated plants and animals, and long distance trade of obsidian and other lithic material (Price 2000; Zapata et al. 2004; Peña-Chocarro et al. 2005).

The inhabitants of the Basque Country probably did not adopt the new culture and language directly from the Anatolian immigrants on the coast, but more likely via a chain of several intermediate cultures, in what Rowley-Conwy (forthcoming) calls 'lurches of advance' (rather than a 'wave of advance'). By the time these 'lurches of advance' reached the Basque Country the Neolithic culture and its concomitant Dene-Caucasian language were acquired from neighbors who were, like them, mainly of native European genetic descent.

The following comparisons reflect terms for domesticated animals (large and small cattle, swine) shared by Basque[53] and Caucasian[54] (+ Burushaski):[55]

- Basque **behi* 'cow'[56] = Cauc: Avar *bóc':i* 'cattle', Andi *buc':ir* 'cattle', etc.[57]
- Basque **sesen* 'bull'[58] = Cauc: Chamalal *zin* 'cow', Tindi *zini* 'cow', etc.[59] = ? Burushaski **chindár* 'bull'
- Basque **ergi* 'steer, young ox, bull calf'[60] = Cauc: Avar *rexé-d* 'cattle, herd', Abkhaz *á-raχʷə* 'cattle', etc.[61]
- Basque **čahal* 'calf, heifer'[62] = Cauc: Avar *ʕačár* 'heifer', Tindi *čara*, Agul *luč*, etc.[63] = Burushaski **chulá* 'male breeding stock' (buck goat, drake).
- Basque **a-huina* 'kid'[64] = Cauc: Andi *kun* 'ram', Tsakhur *kuwar* 'young goat', etc.[65]

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[51] The date given by Lafon, late third millennium BCE, "was the date for megaliths as understood in the 1950s, before the advent of radiocarbon dating. The revised date for that horizon is now somewhere around 4000-4500 BC" (P. Rowley-Conwy, p.c.).

[52] The "Impressa," the earliest wave of farmers getting to eastern Spain, now looks as early as 5800 BC, according to Jean-Denis Vigne (P. Rowley-Conwy, p.c.).

[53] My version of the reconstruction of Proto-Basque (Bengtson 2003, 2004, 2008a, 2010b) is cited, with some of the dialectal forms and/or Unified Basque (UB = *euskara batua*) forms in footnotes.

[54] A selection of attested Caucasian forms is cited, with the PNC, PEC, or PWC reconstruction in footnotes.

[55] Naturally, Burushaski and Caucasian share some terms of these types that are not found in Bsq. See Bengtson (2001).

[56] BN L *behi*, Z *béhi*, B G AN R *bei*. The change of internal resonant + affricate clusters such as **-lc'-*, **-lć'-*, **-rc'-*, **-rč'-* to medial Basque **-(n)h-* in words with final *-i* such as **minhi* 'tongue', **inhi* 'rush (plant)', **behi* 'cow', **bihi* 'grain' is regular, and probably implies the intermediate stages **-(n)ṣ-* > **-(n)x-* (Bengtson 2004: 36). The reflex with a nasal occurs when the original cluster had a lateral, i.e. **-lc'-*, **-lć'-* > **-nṣ-* > **-nx-* > **-nh-*; the reflexes of the rhotic clusters **-rc'-*, **-rč'-* lack the nasal component.

[57] PEC **bħərc̱wV* 'cattle' (NCED 296).

[58] UB *zezen*, diminutive *xexen* /šešen/ 'torito'.

[59] Proto-Avar-Andian **zin-HV* (NCED 262-263).

[60] UB *ergi* [er̄ɣi]. The change of the PDC structure *(H)r(H)VCV > Bsq (H)erC(V) is regular (Bengtson 2004: 42).

[61] PNC **rV̄xwV* 'cattle' (NCED 956).

[62] BN L *xahal* [šahal], Z *xáhal* [šáhal], R *xãl* [šãl], B *txaal* [čaal], etc. Evidence is ambiguous for nasality in Bsq (only in R: cf. the footnote to Bsq **ahari* 'ram', below).

[63] PEC **Hć̣wīlV̄* ~ **Hlīć̣wV̄* 'heifer' (NCED 556).

- Basque: *_bil_-doć ‘lamb (that has begun to feed itself), yearling’[66] = Cauc: Bezhta _biƛ’_ ‘sheep’, Chechen _bož_ ‘he-goat’, etc.[67] = Burushaski *_bélis_ ‘sheep (of 2 years or more); ewe that has given birth’.
- Basque *_ahari_ / *_ahal-_ ‘ram’[68] = Cauc: Hunzib _χor_ ‘ram’, Chadokolob _her_ ‘ewe’, etc.[69]
- Basque *_siki-ro_ ‘castrated ram’; *_siki-te_ ‘castrated goat’[70] = Cauc: Andi _c’:ek’ir_ ‘kid’, Lak _c’uku_ ‘goat’, etc.[71] = Burushaski *_chigír_ ‘(she-)goat’.
- Basque *_urde_ ‘pig, hog, swine’, *_ord-oć_ ‘boar’[72] = Cauc: Hunzib _buƛu (butɬu)_ ‘boar, pig’, Archi _bọƛ’:_ id., etc.[73]

Note also the related terms:

- Basque *_eSene_ ‘milk’[74] = Cauc: Godoberi _š:ĩwu_ ‘milk’, Chechen _šin_ ‘udder’, etc.[75] = Burushaski *_ṣiŋ_ ‘milk’.
- Basque *_e-aici_ ‘to milk’[76] = Cauc: Lezgi _ac:a-_ ‘to milk’, Chechen _=ētt_ id., etc.[77] = Burushaski *_çháo_ ‘to milk’.
- Basque *_gurhi_ ‘1 butter, 2 fat, grease, 3 juice’[78] = Cauc: Lezgi _ʁeri_ ‘butter’, Tsez _χuri_ ‘piece of dry cheese’, etc.[79]

The following comparisons attest to shared vocabulary of grain and pulse crops in Basque and Caucasian (+ Burushaski):

- Basque *_gari_ / *_gal-_ ‘wheat’[80] = Cauc: Tindi _q’:eru_, Lezgi _q:ül_ ‘wheat’, etc.[81]

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[64] Z _ahũ̆ñẽ_, BN _ahuña_, R _añe_.

[65] PEC *_kwĭʔnĭ_ ‘ram’ (NCED 710).

[66] UB _bildots_. Apparently an old compound *_bil-doć_ in which the second element is obscure.

[67] PNC *_bhăƛ̣wĭ_ ‘small cattle’ (SCCG, NCED 293).

[68] The stem variant *_ahal-_ occurs in words such as AN _aal-zain_ ‘shepherd’. The presence of nasality in Zuberoan _ãhã́ri_, _ãhã́y_ is usually thought to require an original nasal: “Una antigua _n_ intervocálica puede restablecerse con mayor o menor probabilidad por ejemplo en sul. _ãhã́(r)i_ ‘carnero’, b.-nav., lab. _ahari_, [etc.]” (Michelena 1961: 303). So Trask (2008), who posits *_anari_ “or conceivably . . . *_anali_.” Rather strangely Roncalese _ári_ lacks the nasal, which suggests to me that there may be other factors in play than hypothetical nasal sonants in creating Bsq nasal vowels (cf. the note to Bsq *_čahal_ ‘calf, heifer’, above).

[69] PEC *_χ[ə]rV_ ~ *_χ[ə]lV_ ‘ewe, ram’ (NCED 1071). All attested forms have _-r-_, but _-r-_ in Andian and Tsezian can come from either PNC/PEC *_r_ or *_l_.

[70] UB G AN _zikiro,_ BN L _zikhiro_; BN (Hazparren) _zikite_.

[71] PNC *_ʒĭkV̆_ / *_ḵĭʒV̆_ ‘kid, goat’ (SCCG, NCED 1094).

[72] UB _urde_. See above (Phonology) for the regular correspondence of Bsq *_-rd-_ to PNC *_-ƛ̣-_ (and other lateral affricates) in intervocalic position. The development of the initial may have been *_burde_ > *_urde_, since the usual Bsq correspondence to PNC *_w_ is *_b_ (MCG 75-76; /b/ also in most Cauc langs.). *_ord-oć_ < *_urde_ + *_oroć_ ‘male’ (Trask 2008).

[73] PNC *_wHārƛ̱wə_ ‘boar, pig’ (SCCG, NCED 1047).

[74] B G L BN _esne,_ AN _esene, ezne,_ R _ezne_, Z _eznẽ́_, with uncertainty whether the original sibilant was *_s_ (orthographic _z_) or *_ś_ (orth. _s_) (Michelena 1961: 163, 352, 401). The external comparanda would favor *_ś_.

[75] PNC *_s̱ă̆mʔV_ ‘milk, udder’ (SCCG, NCED 982).

[76] Z _jaitzi_, AN _jetzi, deitzi_, BN L _deitzi_, etc. The initial _d-_ is thought to be secondary (Trask 2008; Michelena 1961: 184).

[77] PNC *_=āmʒŬ_ ‘to milk; to drink’ (SCCG, NCED 262-263).

[78] Z _gurhi, gorhi_ 1, 2, BN G _guri(n)_ 1, 3, etc. Other forms show a progression from *_gu-_ > _bu-_ (AN G _buriñ_ ‘custard’) > _u-_ (R L Z _urin_ ‘fat, grease’: MDELV V: 845).

[79] PEC *_χərHV_ ~ *_χHərV_ ‘butter, cheese’ (NCED 1071).

- Basque **(gara-)gar̄* 'barley'[82] = Cauc: Rutul *q'ir* 'winter wheat', Agul *q'ir* ~ *q'ur* 'grain'[83] = Burushaski **gur* 'wheat'.
- Basque: **bihi* 'grain, seed, kernel'[84] = Cauc: Godoberi *beč'in* 'rye', Tindi *beč'in* 'barley', etc.[85]
- Basque **sikirio* 'rye'[86] = Cauc: Rutul *sɨk'ɨl* 'rye', Khinalug *sɨlg*-li 'rye', etc.[87]
- Basque **olho* 'oats', **alho* 'wild oats'[88] = Cauc: Kabardian *xʷə* 'millet' < PWC *ƛʷə* id.[89]
- Basque **arto* 'maize' (earlier 'millet') = Cauc: Avar *roƛ:* 'wheat', Agul *jerg* 'oats', etc.[90]
- Basque **ilha-r̄* 'vetch, peas, beans'[91] = Cauc: Tsez *hil* 'pea(s)', Avar *holó* 'bean(s)', etc.[92]

Most impressive, in my opinion, is a whole suite of Basque agricultural terms, involving soil tilling and preparation, harvesting, threshing, sifting, and grinding, that have close Caucasian and Burushaski counterparts:

- Basque **laia* 'two-pronged fork (used for loosening and turning soil)' [93] = Cauc: Bezhta *ƛaχ-dami* 'rake', etc.[94]
- Basque **haincur̄* 'hoe, spade'[95] = Cauc: Chechen *ästa* 'hoe, mattock', Akhwakh *ʕerc:e* 'wooden plow', etc.[96] = Burushaski **harṣ* 'plow'

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[80] The stem variant **gal-* shows up in compound words such as UB *gal-buru* 'head of wheat', *gal-bahe* 'sieve', etc.

[81] PEC *G̱ōlʔe* 'wheat' (SCCG, NCED 462-463).

[82] Here only the second element (with trilled /r̄/) is being compared with the following words, since the first element (with flapped /r/)seems to be identical with the root for 'wheat' **gari / gal-*.

[83] PEC *q̇[ǝ̄]rV* 'a kind of weed, (wild) cereal' (SCCG, NCED 915). The Cauc comparanda cited by Uhlenbeck, Hubschmid, et al. (Lezgi *gerger*, Tabasaran, Tsakhur *ɣarɣar* 'oats', etc., in MDELV V: 22-23) are "phantom cognates," since the velars derive from lateral affricates: Proto-Lezgian **ƛ:arƛ:ar* 'oats' < PEC **rħəƛ̱V* ~ **ƛ̱ħərV* 'a kind of cereal' (NCED 950).

[84] BN L Z *bihi*, AN (Baztan) *bigi* [biɣi]. For phonology of the internal consonant comparison, see the note to Bsq **behi*, above.

[85] PEC *bħĕlč̣i-nV* 'a kind of cereal' (NCED 294).

[86] Based on western Bsq: B G *zikirio* 'rye'. Trask (2008) lumps these together with Bsq *zekale, zekhale, zekele, zekela*, the predominant word for 'rye' in eastern Bsq, which has a clear antecedent in Latin *sēcăle*, Catalan *segol*, etc. (REW 7763). The peculiar phonetics of western Bsq **sikirio* makes derivation from Lat. *sēcăle* less likely, but the whole comparison is problematic from the Caucasian side as well: see the following note.

[87] This comparison is problematic, since NCED (964-965) derives these words from PEC **s̱ūli* / **sūls̱ūli* 'a kind of cereal' ('rye' in Chechen, Lak, Dargi, and Lezgian). The Rutul, Tsakhur, and Khinalug words imply the addition of a diminutive suffix, and then metathesis (PL **s:ol-Vḳ* > **s:oḳol*). For the comparison with Basque to be valid we would require a parallel process in pre-Basque: See also the preceding note.

[88] According to the archeologists oats and millet were not part of the original Cardial "package," but were added centuries later. This comparison could then reflect the substitution of a newer meaning for an older word, as happened for example when Bsq used the old word for 'millet', *arto*, for the new crop maize imported from America (Trask 1997: 307); cf. the familiar example of English *corn*, adapted by American English speakers to mean 'maize'.

[89] PNC **ƛwīʔwV* 'millet' (SCCG, NCED 763-764).

[90] PEC **rħəƛ̱V* ~ **ƛ̱ħərV* 'a kind of cereal' (NCED 950).

[91] BN L Z *ilhar*, AN G *ilar*, B *irar, idar*. Meanings depending on dialect: Z has, for example: *ilhar* 'bean(s)', *ilhar-biribil* 'peas', *ilhar-xuri* 'peas', etc. We assume a phonetic change of the type **hilar̄* > **ilhar̄*. Cf. Basque (L) *ilhargi* 'moon' < **hil-* + **argi* (Trask 1997: 161).

[92] PEC **hōwɬ[ā]* 'bean(s), lentil(s)' (NCED 493).

[93] Source of Spanish *laya* with a similar meaning (Trask 1997: 418 [with doubt]; cf. MDELV VII: 34-35). In initial position PNC **χ* corresponds to Bsq **h*, but between vowels there are few examples. It is possible that the protoform should be **laHia*.

[94] PEC **ƛ̱VχwV* 'rake' (NCED 781-782).

- Basque **arhe* 'harrow'[97] = Cauc: Avar *ʁár*-ize 'to harrow', Lezgi *ʁar* 'harrow', etc.[98]
- Basque **lar̄ain* 'threshing floor'[99] = Cauc: Archi *ƛorom* 'threshing board', Andi *loli* 'threshing, threshing floor', etc.[100] = Burushaski **daltán-* 'to thresh' < **rVŁV-n-*.
- Basque **bahe* 'sieve'[101] = Cauc: Tsakhur *wex:ʷa* 'sieve', Lak *=ihi-* 'to filter', etc.[102]
- Basque **eiho* 'to grind' / **eihera* 'mill'[103] = Cauc: Chechen *aħ-* 'grind' / *ħer* 'mill', Ingush *ħajra* 'mill', Lak *ha=a-* 'grind' / *hara-qalu* 'mill', etc.[104] = Burushaski **-hor-* 'to grind'.

The linguistic evidence presented here indicates that the western Dene-Caucasian speakers of ca. 7500 years ago (linguistic ancestors of the present-day Basques, North Caucasians, and Burushos) had a well-developed Neolithic pastoral-agricultural culture, including the husbandry of large and small cattle and the cultivation and milling of cereal grains and some other crops such as pulses.

How do we know that the Basques did not simply adopt these Dene-Caucasian Neolithic terms as loanwords, while retaining the rest of their original language intact? In fact the Neolithic terms have the same phonology and morphology as the most basic parts of the Basque lexicon. For example, in Basque **olho* 'oats' = PNC **λwĭʔwV* 'millet' we see the same correspondence of Basque aspirated lateral (**lh*) to PNC lateral fricative (**λ*) as in Basque **e-lhu-r̄* 'snow'[105] = PEC **jĭwλV* / **λĭwV* 'snow', and 'snow' can hardly be considered a cultural word that is easily borrowed.[106] Likewise, the phonological relationship between Basque **behi* 'cow' and Andi *buc':ir* 'cattle' is parallel to that of Basque **minhi* 'tongue' = Andi *mic':i* 'tongue',[107] one of the most basic words in any language. Morphologically, the relationship between Basque **eiho* 'to grind' (verb) and **eihera* 'mill' (noun) is the same as that between Ingush *aħ-* 'to grind' and *ħajra* 'mill'. The Basque allomorphs seen in **ahari* / **ahal-* 'ram' and **gari* / **gal-* 'wheat' are entirely parallel to those of the basic **heugari* / **heugal-* 'abundant, copious' / to increase, multiply' (cf. Tsez *=eχora* 'long', Akushi *χala-l* 'big', etc. < PNC **HāχułV* / **HālχV* 'long, big'), and so on. In

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[95] L *haintzur*, Z *háitzür*, R *aintzur*, AN G *aitzur*, B *atxur* [ačur], etc.

[96] PNC **Hrājc̠ū* 'wooden plough, mattock' (NCED 601).

[97] BN L Z *arhe*, AN B G *are*.

[98] PEC **ʁarhV* (NCED 477).

[99] AN G L Z *larrain*, R *larren, llarne*, B *larren, larrin*, etc.

[100] PEC **=V̄rŁV* 'to thresh' (SCCG, NCED 1031-1033).

[101] BN L Z *bahe*, AN (Baztan) *bage*, B G *bae*. The supposed derivation of Bsq **bahe* from Lat. *vannus* 'winnowing tray' (Trask 2008; and see the long discussion in MDELV III: 149-150) is phonologically impossible. There is no trace of nasality in the Bsq vowels, and there is no evidence of a Romance form **bane* supposed by Trask. See REW #9144. My interpretation of the Bsq word is **b-ahe*, i.e., a nominal derivative of a verb cognate with PNC **=i̠fV* 'to sift' with the fossilized class prefix **b-* (MCG 81-88). In formation it is parallel to the proposed Tsakhur cognate *wex:ʷa* 'sieve', compared with the Bsq word long ago by K. Bouda.

[102] PNC **=i̠fV* 'to sift' (NCED 630). Tsakhur *wex:ʷa* 'sieve' is a nominal derivative with formation parallel to Bsq **bahe* (see the preceding note).

[103] BN L *eho* / *eihara*, B *eio*, etc.

[104] PEC **Hĕmχ̠wV* / **χ̠HwĕrV* 'to grind' / 'mill(stone)' (SCCG, NCED 559-561).

[105] BN L *elhur*, Z *élhür*, AN G R *elur*, B *erur, edur*. The final in Bsq **e-lhu-r̄* 'snow' appears to be the same **-r̄* that occurs in many other Bsq words: e.g. **hai(n)cu-r̄* 'hoe, spade', **ilha-r̄* 'vetch, peas, beans', and can be compared with the PNC plural suffix **-r* (MCG 88-89).

[106] For example, the Proto-Indo-European word for 'snow', **sneigʷh-*, persists after millennia in most of the western IE languages, e.g. Welsh *nyf*, French *neige*, Swedish *snö*, Lith. *sniẽgas*, Russian снег, etc.

[107] For the correspondence of Bsq **-(n)h-* to the PNC clusters **-lc'-*, **-lć'-*, **-rc'-*, **-rč'-*, see the footnote to Bsq **behi* 'cow', page 166.

other words, there is no linguistic reason to suppose that Basque words for domestic animals, cultivated plants, and food-processing belong to a different or later layer than the most basic words (e.g., words for 'blood, bone, tongue, tooth, horn', etc.) discussed above (page 161).

In archeogenetics recent results have tried to answer the important question of whether the Neolithic and farming came to Europe mainly through *demic diffusion* (or 'wave of advance' = population replacement) or by *cultural diffusion* (borrowing), or a combination of both. Calderón, et al. (1998), who analyzed immunoglobulin allotypes, represent the former view:

> Our results do not support the hypothesis that the Basques are a relict population of ancient Europeans. They might be the consequence of the colonization of the Basque area by a long-distance migrating group, probably a small Neolithic North Caucasian population that introduced agriculture to the region. They experienced early, rapid demographic growth, and they did not breed with the few hunter-gatherers wandering throughout the area. The North Caucasian migrants could have admixed with North Asian groups dating from many centuries before.

In broad agreement with this, Chikhi, et al. (2002), who analyzed Y-chromosome data, conclude that "local huntergatherers contributed less than 30% in the original settlements . . . the genetic contribution of Neolithic farmers [to the European gene pool] had to be between 65 and 100% . . . Despite some reports of its demise, the original [demic diffusion] model proposed by Ammerman and Cavalli-Sforza [1984] is more alive than ever."

On the other hand Semino, et al. (2000),[108] in a Y-chromosome study, find that

> Haplotypes Eu4, Eu9, Eu10, and Eu11 represent the male contribution of a demic diffusion of farmers from the Middle East to Europe.[109] The contribution of the Neolithic farmers to the European gene pool seems to be more pronounced along the Mediterranean coast than in Central Europe. . . . Analyses of mtDNA sequence variation in European populations . . . suggest that the gene pool has ~80% Paleolithic and ~20% Neolithic ancestry. Our data support this observation because haplotypes Eu4, Eu9, Eu10, and Eu11 account for ~22% of European Y chromosomes.[110]

In a recent survey, Soares, et al. (2010) point out that "Some J lineages [associated with Neolithic migrations from the Near East][111] may have arrived earlier than the Neolithic, so that the levels of Neolithic immigration might still be over-estimated, as has also been suggested for the Y chromosome." They suggest that "less than 15% of European lineages were contributed from the Near Eastern Neolithic component . . . and there was substantial adoption of farming by indigenous groups in many parts of Europe . . . " Zapata, et al. (2004) find that while agriculture reached the eastern coast of Iberia ca. 5600-5400 BCE, there was a considerable delay (four to eight centuries) until farming is attested on the coast of the Bay of Biscay around 5200-4600 BCE. This suggests that the ancestors of the Basques retained their foraging economy for centuries until finally succumbing to the Neolithic advance, and eventually adopting their new Dene-Caucasian language along with other cultural innovations.

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[108] A collaboration of seventeen scholars with the prominent inclusion of L.L. Cavalli-Sforza (see the complete list under References).

[109] These haplotypes have different designations in the standardized terminology ("YCC" 2002). For example "Eu9" corresponds to J2 in Soares, et al. (2010).

[110] B. Comrie gives us this caveat: "All investigations I'm aware of that argue that a certain percentage of Paleolithic genes survive into modern European populations, including the oft-cited Semino et al. [2000] paper . . . ASSUME that the Basques (and some other populations, e.g. the Sardinians) are remnants of Paleolithic populations, and then use this assumption to calculate the percentage of Paleolithic genes elsewhere in Europe – often with very different results (cf. Chikhi, et al. [2002] for percentages very different from those of Semino, et al.). These papers can't therefore be used as EVIDENCE that the Basques are Paleolithic." Bernard Comrie on *Mother Tongue-Long Ranger* email group, Jan. 21, 2008: MTLR@yahoogroups.com

[111] "J2 is thought to be the most important Y-chromosome marker for the spread of farming into southeast Europe" (Soares, et al. 2010).

Conclusions

I propose the following relationships between Basque and other languages in the greater Mediterranean area:

It is indisputable that modern humans have lived in the Basque Country and Gascony for at least 30,000 years (and other hominins much earlier than that). However, it is unlikely that there is an unbroken line of development from the language of the Paleolithic early modern human settlers to the language we know as Basque. The linguistic evidence indicates that a Dene-Caucasian language was adopted, along with a complete "package" of Neolithic agro-pastoralism, from neighboring cultures, with the original stimulus from the Cardial culture. The linguistic features of the oldest Neolithic terms in Basque indicate that they have the same origin as the most basic layers of lexis, *i.e.* they are all Dene-Caucasian.

We can now lay to rest Trask's (1997: 35) categoric statement that "Basque is a genetically isolated language: there is not the slightest shred of evidence that it is related to any other living language ..." This was not even a valid assertion decades ago, when Lafon, Bouda, Trombetti and others assembled copious evidence that generally supports my conclusions here, though in an unsystematic way.[112] It is not disputed that this early evidence was of varying quality, and perhaps as much as 80% of the lexical material has been eliminated by later testing, but the parts that have survived the refiner's fire make up a good portion of the lexical, morphological, and phonological evidence put forth in recent years (especially in Bengtson 2003, 2004, 2008a, 2010b), and only sampled in the preceding pages. Most if not all of the errors rightly criticized by Trask, Jacobsen (e.g. 1995) and others have been eliminated from my recent papers. On the points where I differ radically from Michelena and other vasconists I have given detailed explanations (as seen in some of the footnotes to this article). There is of course still room for argument on some of the specific points, but I believe the overall findings are quite solid as the best available explanation of the origins of the Basque language (Bengtson 2008c).

The relationship between **Dene-Caucasian** and the two other macro-families of roughly Paleolithic time-depth that have impacted the Mediterranean region, **Eurasiatic** ("narrow Nostratic")[113] and **Afro-Asiatic**, is probably as sister (or cousin) languages all deriving from a much older "Borean" ancestor. "I have no reason at all to suppose a closer genetic link between Nostratic and Sino-Caucasian than, say, between Nostratic and Afro-Asiatic or between Afro-Asiatic and Sino-Caucasian" (Starostin 2007c: 454). Fleming's (1991) "Borean" consists of these three entities plus Amerind, and was dated by him "around 45,000 BP." As was typical, Starostin arrived at a *much* younger date for a similar linguistic entity "around the 14th-15th millennium BC" (Starostin 2007d: 817), which is quite close to the estimated age of "Borean" as "15 – 17

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[112] I must give some credit to Chirikba (1985). Though his work was rightly criticized severely (along with my own) by Trask (1995, 1997) and Jacobsen (1995), the fact remains that he was the first to compare Basque with the new Caucasian reconstructions by Nikolayev and Starostin (still unpublished at the time), and his little paper was the initial stimulus that got me working in this area. Thanks also to Vitaly Shevoroshkin for introducing me to Chirikba's paper and the rest of the Sino-Caucasian work being done by the Muscovites.

[113] "Eurasiatic" is Greenberg's term for the macro-family that includes Indo-European, Uralic, Altaic, and others, roughly corresponding to Bomhard's "Eurasiatic", which he sees as a subgroup of Nostratic or a moiety with Afro-Asiatic.

KYA" by Gell-Mann et al. (2009: 25).[114] According to Bomhard (2008: 236) the Nostratic parent language (which gave rise to Afro-Asiatic as well as Eurasiatic) "may be dated to between 15,000 to 12,000 BCE, that is, at the end of the last Ice Age."

In any event, any genetic relationship between Dene-Caucasian and Afro-Asiatic would date long before the spread of agriculture and the rest of the Neolithic cultural package. The few Afro-Asiatic elements in Basque are relatively recent and can be attributed to borrowing from specific AA subdivisions (Egyptian, Semitic, etc.). Some extremely old lexemes (such as those for 'dry' and 'small' discussed on pp. 159-160) can be traced back to a very early Borean stage.

Epilog

In the early 1960s Dan McCall predicted: "The next few decades will see, I am convinced, an efflorescence of multi-disciplinary historical research.[115] This will recover for us much of the human picture and give us an increasing abstraction of historical horizons" (McCall 1964: 155). Dan's prediction is coming true: we live in an extremely exciting time in which the usually discrete Four Fields of Anthropology are managing to work together and produce an ever clearer picture of human prehistory.

Acknowledgments

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Languages/dialects:

AA : Afro-Asiatic (Afrasian, Hamito-Semitic); **AN** : Alto Navarro (Bsq); **B** : Bizkaian (Bsq); **BN** : Basse-navarrais (Bsq); **Bsq** : Basque; **Bur** : Burushaski; **Cauc** : (North) Caucasian; **DC** : Dene-Caucasian; **G** : Gipuzkoan (Bsq); **L** : Lapurdian = Labourdin (Bsq); **PAA** : Proto-Afro-Asiatic; **PAE** : Proto-Athabascan-Eyak; **PDC** : Proto-Dene-Caucasian; **PEC** : Proto-(North-)East-Caucasian; **PIE** : Proto-Indo-European; **PNC** : Proto-(North) Caucasian; **PST** : Proto-Sino-Tibetan; **PY** : Proto-Yeniseian; **R** = Roncalese (Bsq); **UB** : Unified Basque = euskara batua; **Z** : Zuberoan = Souletin (Bsq)

MCG	Materials for a Comparative Grammar = Bengtson (2008a)
MDELV	Materiales para un diccionario etimológico de la lengua vasca = Agud & Tovar (1988-)
NCED	North Caucasian Etymological Dictionary = Nikolaev & Starostin (1994)
REW	Romanisches etymologisches Wörterbuch = Meyer-Lübke (1911)
SCCG	Sino-Caucasian Comparative Glossary = Starostin (2005b)
TOB	Tower of Babel: Etymological Databases (Starostin, et al.)

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[114] Their version of Borean is similar to Fleming's except that it includes Austric rather than Amerind!

[115] McCall meant here History in the large sense, including contributions from "archaeology, linguistics, ethnology, ethno-botany and ethnozoology, physical anthropology and serology, geography, physics and the analysis of art" (Ibid., p. 7). See also Hal Fleming's discussion of these issues, pp. 3-4 of this volume.

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MOTHER TONGUE
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In Memory of Daniel F. McCall

Sketches of Scholars I:

Aaron Dolgopolsky, *Octogenarian*

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Aaron Dolgopolsky[1] [Aron Borisovič Dolgopol'skij] was born into a family of Russian Jews in Moscow on November 18, 1930. He studied general linguistics and Romance linguistics, and his postgraduate study was focused on comparative linguistics. Till his departure from the Soviet Union for Israel in 1976 he worked in the Academy of Sciences of the Soviet Union. Thanks to the Helsinki Protocols (1975) his emigration was quite legal. In spite of this fact his name had to be eliminated from all Russian libraries and publications edited in the Soviet Union from 1976. Some of Dolgopolsky's pupils quoted at least titles of his publications without the name of the author (A. Militarev, O. Stolbova). The only scholar of the Soviet era who had the courage to cite his full name was the orientalist Igor M. Ďjakonov [Diakonoff].

First of all Dolgopolsky was interested in applications of statistics to lexicon. This interest led him to question whether similarities between various language families cannot reflect traces of their common protolanguage. Thanks to his mathematical erudition he was able to argue that the number of similarities is higher than accidental. He also mapped various language families from the point of view of the most stable lexemes in their lexicons (##1, 4, 8, 44). At the same time he understood that the anticipated and mathematically unexcluded distant relationship of language families can only be proven using the same methods which are applied as standard proof of genetic relationship within firmly established language families. In other words, he tried to establish sound correspondences between the reconstructed protolanguages of Afroasiatic, Kartvelian, Indo-European, Uralic and Altaic language (macro-)families, which were assumed by him to be descendants of a common proto-protolanguage (##3, 5, 6).

During this time he found that a young slavicist, Vladislav M. Illič-Svityč (1934-1966), led his research in the same direction, taking into account in addition Dravidian. For this hypothetical protolanguage Dolgopolsky first offered the term *Sibiro-European*, but he accepted the term *Nostratic* in agreement with Illič-Svityč which was first articulated by Holger Pedersen already in 1903. Later Dolgopolsky argued that the term Nostratic is rather 'Nostrato-centric' and the speakers of non-Nostratic languages, *e.g.* of Austronesian, should use the term 'Vestratic' for them. For this reason he chose the term *Boreal*, inspired by the Greek word for "North." Today this term (Boreal or Borean) is used in the sense of a hypothetical ur-ancestor of Nostratic (including Afroasiatic) and Dene-Sino-Caucasian.

Both Illič-Svityč and Dolgopolsky thought that some of so called 'Paleo-Siberian' languages, *e.g.* Yukaghir or Chukcho-Kamchatkan, belonged to Nostratic. Dolgopolsky later added Nivx and Eskaleutan as well. They were also in agreement that the level of reconstruction was weakest in the case of Afroasiatic at that time. For this reason Illič-Svityč decided to work in the field of Chadic languages and Dolgopolsky specialized in Cushitic languages. Unfortunately, already in 1966 their fruitful cooperation was interrupted by the tragic death of Illič-Svityč, who was knocked down by car (see #11). On the basis of notes and files of Illič-Svityč their colleague

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[1] Also in Israeli Hebrew form: *Aharon* אַהֲרֹן [Ed.].

Vladimir A. Dybo was able to prepare for publication three volumes of the Nostratic dictionary (1971, 1976, 1984). Dolgopolsky continued to refine the Nostratic reconstruction (##10, 17, 20, 22, 32). By the beginning of the seventies, fortunately, he did not remain in isolation. The questions of distant relationship became legitimate, later even attractive, and soon Dolgopolsky was surrounded by a group of pupils who formed the Nostratic seminar. At the same time he continued in his research of the Cushitic languages (see #28).

After his emigration from the Soviet Union not only Dolgopolsky's publications, but also the Nostratic hypothesis itself, were designated as 'Jewish linguistics' and repudiated (a historical precedent with A. Einstein and S. Freud is more than evident). The Nostratic hypothesis was pushed into illegality, and thanks only to the personal courage of Vladimir Dybo and his daughter Anna Dybo, who organized 'flat seminars',[2] work on Nostratic continued till the time of Mikhail Gorbachev and his *perestrojka*. Thanks only to this thaw, the former teacher and his pupils could meet at the conference on distant relationship organized by Vitaly Shevoroshkin at Michigan University in Ann Arbor in 1988.[3]

After Dolgopolsky's move from Moscow to Haifa he began to give lectures about the historical grammar of Hebrew in a Semitic context. His training in accentology (representing the school of his former colleagues Vladislav M. Illič-Svityč and Vladimir Dybo) opened for him a new space in Semitic reconstruction also. Dolgopolsky successfully demonstrated that various irregularities in Hebrew and other Semitic languages can be explained on the basis of accentology. Very valuable is a series of his articles devoted to problems of the Indo-European homeland (##45, 48, 61). In 1999 his published historical phonetics of Hebrew (#71) in Semitic and Afroasiatic context is an exceptional study overcoming the traditional, usually only descriptive, level of similar syntheses.

During the last two decades he has worked intensively on his life's *opus magnum*, the *Nostratic Dictionary*. Its preliminary version has been available on the website of the University of Cambridge since 2008 (see #79). It is really a monumental opus, where on more than 3,000 pages the author analyzes more than 2,800 entries with full material and bibliographical documentation. Thanks to his many-sided linguistic erudition Aaron Dolgopolsky has frequently been invitated to participate at numerous conferences, where he presented his contributions devoted especially to Afroasiatic languages or the questions of distant relationship. Unfortunately, after his brain apoplexy and temporary loss of memory his mobility has been limited to his home in Haifa for the past two years. Fortunately his mental condition is again admirable, and thanks to the telephone he remains at least in verbal contact with other scholars. On his eightieth birthday let us wish him a lot of health, strength and energy to finish his *Nostratic Dictionary*, publish his numerous manuscripts, and to continue in his excellent studies in the field of Afroasiatic comparative linguistics and others.

In the following list of Dolgopolsky's scientific texts both publications and unpublished manuscripts were included, the former numbered, the latter indicated by letters of alphabet.

Monographs and articles

1961
(1) "Statističeskoe izučenie soxranjaemosti leksiki". In: *Tezisy dokladov Mežvuzovskoj konferencii po primeneniju strukturnyx i statističeskix metodov issledovanija slovarnogo sostava jazyka*. Moskva 1961, 87-90.
1963

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[2] *I.e.*, the seminars were conducted in private apartments (flats) rather than in academic settings [Ed.].

[3] This important gathering was celebrated in our 2008 issue (MT XIII) [Ed.].

(2) "Están emparentadas las lenguas de Europa, Asia y Africa del Norte?" *Tlatoani* (México) 1963, 17.

1964

(3) *Gipoteza drevnejšego rodstva jazykov Severnoj Evrazii (problemy fonetičeskix sootvetstvij).* Moskva: VII Meždunarodnyj kongress antropologičeskix i ėtnografičeskix nauk 1964, 1-21.

(4) "Gipoteza drevnejšego rodstva jazykov Severnoj Evrazii s verojatnostnoj točki zrenija". *Voprosy jazykoznanija* 1964/2, 53-63.

(5) "Metody rekonstrukcii obščeindoevropejskogo jazyka i vneindoevropejskie sopostavlenija". In: *Problemy sravniteľnoj grammatiki indoevropejskix jazykov*, ed. S.B. Bernštajn & N.S. Čemodanov. Moskva: Izdateľstvo Moskovskogo univerziteta 1964, 27-30.

1965

(6) "Metody rekonstrukcii obščeindoevropejskogo jazyka i sibiroevropejskaja gipoteza". *Ėtimologija 1964* (1965): 259-70.

(7) [translation and remarks] Swadesh, Morris: "Lingvističeskie svjazi Ameriki i Evrazii". *Ėtimologija* 1964 (1965), 271-311 + poznámky A. Dolgopolského 311-322.

(8) "Soxranjaemosť leksiki, universalii i areaľnaja tipologija". In: *Lingvističeskaja tipologija i vostočnye jazyki*. Moskva: Nauka 1965: 189-195.

(a) *Macha Oromo Field Notes*. Moskva 1965-68. Ms.

1966

(9) "Materialy po sravnitel'no-istoričeskoj fonetike kušitskix jazykov: gubnye i dental'nye smyčnye v načal'nom položenii". In: *Jazyki Afriki*, ed. B.A. Uspenskij. Moskva: Nauka 1966, 35-88.

(10) "Nostratičeskie osnovy s sočetaniem dvux šumnyx soglasnyx". *Problemy slavjanskix ėtimologičeskix issledovanij v svjazi s obščej problematikoj ėtimologii*. Moskva 1966, 48-50.

(11) [+ V.A. Dybo] "V.M. Illič-Svityč" (nekrolog). *Izvestija AN SSSR*, serija literatury i jazyka 25/6, 1966, 563-564.

1967

(12) "Ot Saxary do Kamčatki jazyki iščut rodstvennikov". *Znanie - Sila* 1967/1, 43-46.

(13) "V poiskax dalekogo rodstva. *Russkaja reč* 1967/6, 95-112.

(14) "Struktura semitoxamitskogo kornja v sravniteľno-istoričeskom osveščenii". In: *Problemy jazykoznanija*. Moskva: Nauka 1967, 278-282.

1968

(15) "Drevnie korni i drevnie ljudi". *Russkaja reč* 1968/2, 96-108.

(16) Zamečanija k staťi Illiča-Svityča, Sravnenie smyčnyx nostratičeskix jazykov *Ėtimologija 1966* (1968), 401-404.

1969

(17) "Nostratičeskie osnovy s sočetaniem šumnyx soglasnyx". *Ėtimologija 1967* (1969), 296-313.

(18) "Jazyki Afriki i argument meteli". *Znanie - Sila* 1969, No. 11: 26-28.

1970

(19) A Long-Range Comparison of Some Languages of Northern Eurasia. In: VII Meždunarodnyj kongress antropologičeskix i ėtnografičeskix nauk / VII Intern. Congress of Anthropological and Ethnographical Sciences, Vol. 5. Moskva / Moscow 1970: 620-634).

(b) "*Yukagir Notes*". Moskva, 1969-70. Ms.

(c) "Field notes of Upper Kolyma Yukagir" (1970's). Ms.

1971

(20) "Nostratičeskie ėtimologii i proisxoždenie glagol'nyx formantov". *Ėtimologija 1968* (1971), 237-242.

1972

(21) "Materialy po sravnitel'no-istoričeskoj fonetike kušitskix jazykov: veljarnyj zvonkij v anlaute". In: *Problemy afrikanskogo jazykoznanija: Tipologija, komparatistivistika, opisanie jazykov*, ed. Oxotina, N.V., Uspenskij, B.A. Moskva 1972, 197-216.

(22) "Nostratičeskie korni s sočetaniem lateral'nogo i zvonkogo laringala". *Ėtimologija 1970* (1972), 356-69.

(23) "Opyt rekonstrukcii obščenostratičeskoj grammatičeskoj sistemy. A. sistema ėnklitik i mestoimenij. B. Nostratičeskij sintaksis". In: *Konferencija po sravnitelno-istoričeskoj grammatike indoevropejskix jazykov*, ed. S.B. Bernštajn et al. Moskva: Institut slavjanovedenija i baltistiki AN SSSR 1972, 32-34.

(24) [+ Golovastikov, A.N.] "Rekonstrukcija čukotsko-korjackix kornej i nostratičeskie ėtimologii". In: *Konferencija po sravniteľno-istoričeskoj grammatike indoevropejskix jazykov*, ed. S.B. Bernštejn et al. Moskva: Institut slavjanovedenija i baltistiki AN SSSR 1972, 27-30.
(25) "O proisxoždenii ličnyx okončanij glagolov v vostočnosidamskix i irakvskix jazykax". In: *Africana = Afrikanskij ėtnografičeskij sbornik* IX (= *Trudy Instituta ėtnografii im. N.N. Mikluxo-Maklaja*, t. 100) 1972, 103-112.
(26) "La permutation des **m* et **b* initiaux dans les langues couchitiques". In: *Congrès International des africanistes*, 2$^{\text{ème}}$ session. Paris: Présence africaine 1972, 225-234.
(27) "Kakie jazyki rodstvenny evropejskim?" *Nauka i čelovečestvo* 1971-72, 106-119.
1973
(28) *Sravnitel'no-istoričeskaja fonetika kušitskix jazykov.* Moskva: Nauka 1973.
(29) "Materialy po leksike jazyka xadija. Imennyje časti reči". In: *Bespiśmennye i mladopiśmennye jazyki Afriki*, ed. N.V. Oxotina & A.B. Dolgopoľskij. Moskva: Nauka 1973, 57-82.
(30) [+ V.A. Dybo & A.A. Zaliznjak] "Vklad Illiča-Svityča v sravniteľnuju grammatiku indoevropejskix i nostratičeskix jazykov". *Sovetskoe slavjanovedenie* 1973/5, 81-92.
(31) "Boreisch - Ursprache Eurasiens". *Bild der Wissenschaft* 1973, 1140-1146.
1974
(32) "O nostratičeskoj sisteme affrikat i sibiljantov". *Ėtimologija 1972* (1974), 163-176.
1975
(33) "Jazyki i problemy prarodiny". *Znanie - Sila* 1975/6, 15-19.
(34) "Nostratičeskie jazyki". In: *Boľšaja sovetskaja ėnciklopedija* 12, 272.
(35) "Paleontologija lingvističeskaja". In: *Boľšaja sovetskaja ėnciklopedija* 19, 113.
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In Memory of Daniel F. McCall

Sketches of Scholars II:

James Mallory, *Sexagenarian*

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Masaryk University,
Brno, Czech Republic

A many-sided archaeologist, a specialist in Celtic and Indo-European studies who is admirably orientated in comparative mythology, historian, translator, editor of three archaeological and one linguistic journal, editor or co-editor of six monographs, himself a fruitful author or co-author of six books, 120 articles, 20 reviews, charismatic university teacher and for a long time a warden of the campus of Queen's University in Belfast in Northern Ireland, and also a father of three children. It all characterizes only one man, although it is enough at least for three succesful careers.

James Patrick Mallory was born on October 25, 1945 in the USA and till the present he remains an American citizen. In 1963-1967 he studied history at Occidental College in Los Angeles. He spent two years in the Military Police of the US Army (1969-71), where he finished with the rank of sergeant. He returned to the study of Indo-European studies at University of California in Los Angeles (1971-73), where he graduated as a doctor of European archaeology (1975). In Los Angeles he met an archaeologist of Lithuanian origin, Marija Gimbutas, who influenced his subsequent scientific interests. In 1975-77 he gave lectures alternating between both of his universities, Occidental College and the University of California in Los Angeles.

Since 1977 his resident *Alma mater* has been the oldest university in Northern Ireland, Queen's University in Belfast. With the exception of 1980, when he returned to UCLA for one year, he remains in Belfast till the present time. He began as a visiting lecturer, continued as a senior research fellow at the Institute of Irish Studies, from 1981 lecturer in archaeology at Queen's University, 1991-95 senior lecturer in archaelogy, 1995-98 reader in archaeology and finally from 1998 professor of prehistoric archaeology with specialization in the Neolithic and the Bronze Age. In 1996 he also became a member of the Irish Royal Academy.

The sphere of his archaeological interests is really large, from Ireland to Central Asia, including Sinkiang in northwest China – briefly said, throughout all territories where Indo-Europeans live or have lived. Since his first monographic article in 1973 Mallory's big ambition has been mapping traces of the Indo-European homeland. In its putative location on the North Pontic steppes the influence of Marija Gimbutas is most visible. He accepts her Kurgan hypothesis and develops it further. Thanks to his rational argumentation, combining the interpretation of archaeological results with linguistic data, the North Pontic location has become the most popular solution to this centenary problem. But this does not mean that he rejects *a priori* other arguments supporting different locations.

One of the most important merits of Mallory is his multidisciplinary approach. Contrary to most of the present archaeologists he need not borrow second-hand information from Indo-European comparative linguistics or comparative mythology, but he is able to orientate himself in them firsthand. His broad language abilities, including an active knowledge of Russian, afford him the results of archaeologists and linguists which are inaccessible for most of his American or West European colleagues. Extraordinary valuable is his personal participation at numerous archaeological expeditions from Ireland through Ukraine to Kazakhstan. In 1989 Mallory published the monograph *In Search of the Indo-Europeans*, which stimulated a wide and mostly positive reception. Since that time the book has been edited in several reprints and also translated into Modern Greek, Turkish and Croatian.

Already in 1997 Mallory and his colleague Douglas Q. Adams edited a collective monograph, *Encyclopedia of Indo-European Culture*, a book of monumental size not only in its 875 pages. It represents a unique synthesis of Indo-European linguistic paleontology, archaeology and mythology from the end of the 20th century, arranged in encyclopedic entries. Although most of them were written by the editors themselves, fifteen other scholars supplemented them. Also valuable is the inclusion of external comparisons in the encyclopedia.

In 2000 a new book *The Tarim Mummies: The Mystery of the First Westerners in Ancient China* appeared, written together with the American sinologist Victor Mair. It represents not only a valuable archaeological survey of Northwest China and adjacent regions, but also it is the first comprehensive study devoted to the Tocharians, the easternmost Indo-Europeans of the precolonial era.

A brilliant demonstration of the possibilities and limits of linguistic paleontology is the monograph *The Oxford Introduction to Proto-Indo-European and The Proto-Indo-European World* from 2006, where Mallory together with Adams systematically map the Indo-European lexicon, applying the method *Wörter und Sachen*.

It is apparent that Jim Mallory is a many-sided scholar, who is able both to lead archaeological excavations and to publish extensive syntheses, frequently with other renowned archeologists, linguists, mythologists, anthropologists and geneticists. Let us wish to this giant of Indo-European studies (it is valid not only metaphorically, but also literally, with regard to his height of two meters)[1] a lot of health, innovation in his research, and energy to continue in his convincing demonstration of the fruitful cooperation of humanities and science.

Let us make known here the rich editorial and auctorial activity of James Mallory:

Editor of journals:
1. *Journal of Indo-European Studies* (Washington, D.C.), 2000 - .
2. *Emania: Bulletin of the Navan Research Group* (Belfast), 1986 - .
3. *Journal of Irish Archaeology* (Dublin), 2009 - .
5. *Ulster Journal of Archaeology* (Belfast), 1984-1986.

Member of editorial boards of journals:
3. *Journal of Irish Archaeology* (Dublin), 1983 - .
4. *Ulster Journal of Archaeology* (Belfast),1987 - .

PUBLICATIONS

* = co-author or co-editor

Monographs:

1989

(1) *In Search of the Indo-Europeans*. London. Thames and Hudson. [1995 *Oi Indo-europaioi.* Athens, Ekdosis Delphini (Greek translation); 1996 *A la recherche des Indo-européens*, Paris, Seuil (revised and translated into French); 2002 *Hint-Avrupalilarin Izinde*, Ankara, Dost (Turkish translation); 2005 *U Potrazi za Indoeuropljanima*, Zagreb (revised, extended and translated into Croatian)]

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2006
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(3) The chronology of the Early Kurgan tradition, pt. 1. *Journal of Indo-European Studies* 4, 257-294.
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1981
(5) The sword of the Ulster Cycle. *Studies on Early Ireland* (Ed. B. Scott), Belfast, 99-114.
(6) The ritual treatment of the horse in the Early Kurgan tradition. *Journal of Indo-European Studies* 9, 205-226.
1982
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Gone Missing: some recent extinctions and some fakes

By ASLIP staff

We think it useful for our members to have access to data from recently expired languages, much of which does not make it into international journals or receive much attention from non-specialists in a particular region. Most of these languages have expired because their societies have abandoned them, in favor of more widely spoken languages and those which make social advancement possible. Thus for a young Kenyan learning Swahili or English is much more useful than his mother tongue which has no speakers outside of his home town. Moreover an important regional language must also be learned, such as Masai for an El Molo and a Yaaku; or Oromo for a Bosha.

However, ASLIP's viewpoint is totally opposite to the embattled young Ongota's or Qwadza's. We are looking the other way, to the past, to where his native language came from and to whom it is related and what it can contribute to our knowledge of human prehistory. Qwadza may seem like a blip, a nothing, in a sea of Bantu powerhouses like Swahili or Gogo. But Qwadza represents the most southerly of all the Afroasiatic tribes in the world and the second most ancient occupants of Tanzania and east Africa. So, yes, ASLIP has an interest in these poor little extinctions!

El Molo and Ann Beaman

In northern Kenya near the southern shores of Lake Rudolf (or Lake Turkana in modern times) there is an island on which some strange people live. They are strange because modern researchers in the medical professions have decided that the inhabitants are turning to stone, due to their consumption of Lake Rudolf's water. We have heard no follow ups on this story in the mass media but a while back it was borderline sensational.

Why would such a folk live on an island anyway? There is plenty of room on the mainland. In fact some of these theoretically stoned people do live on the mainland nearby. The island is there as a refuge, the neighboring peoples being so aggressive that a place to hide or paddle to was much needed. Neighbors such as the Masai or the hyper-aggressive Turkana who push the Masai themselves around and whose name graces the lake in modern times.

Who are these islanders? They call themselves ***in'ímolo*** and their country ***kóóràn.*** The neighboring Samburu Masai call them ***ides*** and they are known to the rest of the world as the ***El Molo***. They remained unstudied for most of modern times until two of our colleagues visited them in the 1970s. ***Ann Beaman***, then a doctoral candidate in anthropology at Boston University, visited them in 1978. Now Dr. Beaman, she was undertaking a full field ethnography of the neighboring ***Rendile***, a Somaloid tribe who lived south and southeast of Lake Rudolf or just east of the Samburu. Under less than propitious field conditions Beaman was not able to stay very long but was able to record nearly 300 words of El Molo. Those data remained unpublished until now but constituted about half of the data available on El Molo. The remainder were recorded and published by Professor Bernd Heine of Universität Köln, Germany, in 1972.[1]

Since *Afrika und Übersee* is a well-known international journal, we will not reproduce Heine's report here. Still it is important for an extinct language that there be two sources and even better that they largely confirm each other. Beaman's and Heine's reports for the most part do that, while also complementing each other. For those who would have more data on El Molo, there is a distinct possibility that there exists an El Molo speaker among the Samburu. As we learned in another case (see Bosha below) single native speakers, in a sense linguistic isolates, may be found many years after a language has ceased to exist socially. Sometimes we may still record more of an extinct language! In El Molo's case a sizable increase in animal terms and the lexicon of the age-grading system would be most valuable.

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[1] Bernd Heine.1972/1973. "Vocabulare Ostafrikanischer Restsprachen. Teil I. El Molo." *Afrika und Übersee*, Band LVI, 276-283.

Dr. Ann Beaman's El Molo data are, as follows:[2]

One verb conjugation in the present tense:

ányiga	I drink, I am drinking
anánduge	thou art drinking
bíče déega	he is drinking water
arwaté bíče-nyíige	the girl is drinking water
bičé níina	we are drinking water
bíče déega	they are drinking water
guráso bičé síiga	those are drinking water

Obviously El Molo is quite complex grammatically and hard to analyze

All	nyaráasò, wa-nyaráasò . 2nd form is full citation.
Ant	ênse .
Arm	ub= . The unaspirated [b=] sounded like a [p].
Ashes	ílsò . But interpreter called it 'charcoal' .See Rendile [ilees] = 'steam, hot vapor'
Baby	ele nyárd'o . Perhaps 'small child' is better. Cf [$^{?}$ele] = 'child'
Back (of body)	rééRà .
Bad	hawóla .
Bark, of tree	síiRìs , síigìs .
Bed	múkùl
Belly, stomach	gêrê.
Big	guuta, Ruuta, wáguuta, wáRuuta . 3rd and 4th forms are full citations where [wa] is an obvious prefix.
Bird	kííxòč . It may be a species of bird, not a general term. Heine has [ráu$^{?}$] which also lacks an external cognate, so far as we know.
Black	yiiti-da .
Blood	díìg= . Common East Cushitic.
Body, skin of body	gon . Semantically just the same as Amharic.

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[2] These data were recorded by Ann Windsor Beaman, on February 8, 1978 at Loyengalani, Kenya. Her informants were two elders, members of lkileku age-set which had been circumcized in the early 1920s. Their names were Sogorte Lesigauke and Kurume Lenabirr, both were native born, and the latter was the former chief of the El Molo. The informants spoke Samburu too which was used as the language of interrogation, supplemented by Swahili. Interpreters spoke to Beaman in Rendile and English, so there was some uncertainty about translations. Beaman apparently heard no glottalized consonants; Heine had. Thus the consequences for proto-East Cushitic of Heine's having heard [č'], [g'], and [b'] are that he was not confirmed in hearing them..

Bone	laf .
Boy	náálebà . .
Breast (woman)	ê'ênu .See 'milk'
Brother	mársàd .But see 'sister'. Properly both probably mean 'sibling'.
Burn, roast	waat .
Buttock	ðub= . Ergo 'buttocks', backside. The [ð] is a voiced dental stop, a forward [d], not a fricative. The [b=] is unaspirated. See also Rendile [ðub=] 'buttock'. Or a more general term for 'tail'.
Camel	gal
Chair, stool	káára . See 'headrest' elsewhere. E.g., Gawwada [kêre] 'headrest' and Ongota [kire] = 'stool'
Chest, thorax	kač .
Child	hélè, $^{?}$élè.
Circumcize, to	anâìnì . Not sure where to make the cut. Pardon the word play !.
Cloud, fog	yábtè .
Cold	ámbárrà .
Cook, to	karis , èrèkaris . 1st form owes to Heine's analysis; 2nd is full citation given by Beaman.
Country, land	bíyà. Also probably means 'earth' .
Country of El Molo.	kóóràn .
Cow	ot .
Daughter	nátadéiyà$^{?}$. Beaman says see Rendile [déyaHò] = 'female'.
Day	úro, urôlog= .
Die, to	inúwêì, inúwêyì .
Dog	kêr . See Arbore [ker], Rendile [ker], and Saho [kare].
Donkey, ass	ol .
Door (way)	góóròt . Presumably the opening, not the movable blocker.
Down, low	biiyégêlà . Beaman thinks it means 'enters earth'. See [bíyà].
Drink	adúgà .
Drop	bigayí-te, iníbigayítè . 2nd form is full citation. We are not at all sure of the cuts. El Molo is a very difficult language to analyse!
Ear, ears	neb= , nêbêlámà. Probably equals 'two ear' or 'ears two'
Earth	bii, biy . Also can mean 'soil' or 'grass'. See also [bíyà]. 'country'.
Eat food, I eat food.	Num-aŋ-ámà . See Footnote 2 for the problems Beaman faced in getting translations which are vital in grammatical work.
Eight, 8	ßüe . Cardinal number. Heine has [fue$^{?}$]. Unique to El Molo.
Eighteen, 18	tomon-o-ßüe . Cardinal number.
Elbow	yir .
Eleven, 11	óó-táRà, tómon-oo-taRa . Cardinal number. 1st form is a short hand version of the 2nd or 'and 1', instead of '10 and 1'.
Empty	waníínamágerò . She thinks it means 'a little there isn't'.
Eye / eyes	il / il-lámà
Fall	maníré, maníhreè .
Fat	sííbi, síìßì . Probably = fat of meat.
Father	aa
Feces, shit	aŋútuna. She wonderes if it is a verbal form. Then the root would

	be [tuna].
Fence	gáárò. Noun.
Few	níninidà. Probably just means 'small it is'.
Fifteen, 15	tomon-ó-čèn. Cardinal number.
Finger	kúnùf, kúnußò. First form is found in Arbore and Galab (Dasenech)
Fingers	farro. No doubt [farro] really means 'hand'.
Fingers, fingernail	farro. Serious confusion in translation. But later she gives [farro] as 'toes'. So primary meaning seems to be 'digit'.
Fire	éèg.
Firewood	hóró.
Fish	bêêg=. Tone pattern / \\. Final [g=] is unaspirated.
Five, 5	čên. Cardinal number.
Fly, bug	kênnête. Also 'mosquito'.
Food	num.
Foot, hand / ankle	mótolač / motolač . Surely another translation problem.
Four, 4	áfùr. Cardinal number. More like Oromo than Somali or Rendille.
Fourteen, 14	tómon-o-áfùr .. Cardinal number.
Frog	bálbalič .
Full	dífa .
Girl	árwatè .
Give birth, to	níd'alè . The root may be [d'al]. See Oromo [d'al].
Goat	ree .
God, god	waag, waaR, sometimes writ as [waaγ], the voiced velar fricative or French 'r' or Hoch Deutsch 'r'. It corresponds to Oromo [k'].
Good	abódà. See Ongota 'good' = [ˀabba].
Grandchild	êsì . It also means 'grandfather', thus it is a reciprocal term.
Grandmother	δúnù .
Green, yellow	ilíi-dà , ilil .. A bit strange for a color combination.
Hair (of head)	rúßàn . See Rendile [rif] or 'long hair'. The [ß] is a voiceless bilabial fricative, an allophone of /f/. Also Oromo [rifén-sa] 'hair'.
Head	mêtê .
High, up	úro. Adjective or preposition?
Hill	wáábês .
Hip	gêêčò .
Horn (animal)	dêgêr .
Horse	fárò . Makes a minimal pair with [farro] 'fingers', q.v. .
Hot	kúllà .
House	min .
The house is old.	Miniguutare.
Human being	ínímotò .
Hundred, 100	tómonílaabò . Cardinal number. We hesitate to analyse it.
Hurt (intransitive), have pain	kúllà . See 'hot'.
Hurt (intransitive), have pain .	ántúla . Maybe it equals 'I hurt', suggests Ms. Beaman.

Hurt (transitive), injure.	abóneed'è . The [d'] is a retroflex implosive, so at least one glottalized consonant was heard by Beaman.
Jump, to	an-ðuúrà . See Rendile [ðður] = 'dance'. Also heard as [dur]. It brings to mind the jumping style dancing of the Masai.
Kill, to	hun . See Rendile [hun] = 'pierce'.
Knee	gum .See North Omotic [*k'um] = 'knee'.
Leaf (plant)	bínàr .
Leg / legs	lug= / lug-lama . Plural literally means 'legs two' .
Lion	nêêg= . See southern Oromo [neika] 'lion'. (Hobley's Ariangulu)
Long	déêri-d'à . See common East Cushitic [*d'eer].
Man	géèr .
Many	gúúti-d'à .
Meat	sow .
Moon	lêê . Note: stress marks not shown.
Milk	ênuma . 1st syllable has the stress.
Morning	búrrè.
Mother	íŋgò . See Rendille's 'older woman not in my clan'.
Mountain	bíí-gutò . Literally 'big earth' or 'big country'.
Mouth	óò . See Arbore [$^{?}$ohoó] 'mouth' and Ma'a (Mbugu) [mu-$^{?}$o]
Neck	lúRù . See Rendile [luxum] .
Night	kisa$^{?}$.
Nose	sóónò .
Nine, 9	saaRal . Cardinal number. See Oromo [sagal].
Nineteen, 19	tomon-o-saaRal .
Noun suffix, plural	lama, elama . See 'ear' and 'ears'. It seems to also = 'two'.
Old	nígutarè
Old person	iníguutadè
The house is old.	Miniguutare
One, 1	tókò . Cardinal number. But [taRa] and [toxo] have also been recorded. See Oromo [tokko] 'one', Konso [takka], Arbore [takka].
Penis	jiir .
Plant (noun)	êkaytè .
Pray	watădeerà
Rain (noun)	íyêênê , iliyêênê .
Red	búridà , búrrê . Beaman says, see 'morning' .
River, water	bíčè . It is remarkable that they live on an island in a very large lake, yet have borrowed the Rendile word for 'water'.Yet Arbore has the same form, while Baiso has the most conservative form of it, namely [bekee].
River, dry	bíče-mágerò . See Swahili [laga]. Literally = 'there is not water'.
Rock	$^{?}$êl . Probably a large rock. See Rendile [Hal] = 'mountain' .
Roof	d'ug= .
Run	ayárða
Saliva, to spit	ênyufà . See Rendile [Hanjuf].
Sand	êkírtè .

Seven, 7	tiiba . Cardinal number. It may have been borrowed from Rendile [teeba] because El Molo should have a [z] or [w] in it.
Seventeen, 17	tomon-ó-tiiba .
Sheep	êlmò . See Rendile [hêlmo] = 'rams' .
Shoulder	kol, kolláma *(plural).*
Sing, to	kurêndàg= .
Sister	mársàd .
Sister	árwatè . But see 'girl' above.
Sit, to	asííyà .
Six, 6	yíì . Cardinal number. Heine has [yíi$^{?}$]. A really worn down word, probably from [*liH].
Sixteen, 16	tomon-a-yíì . .
Sky	waag= . See 'God'.
Sleep, to	áŋ-íìfa . Also means 'lie, liedown'. See Rendile [jif] = 'lie down'.
Sleepy	an-ráfa . Verbal form? She asks. See Oromo [raf-u] 'to sleep'.
Small, short	wa-níìna, níníníla . 1st form may be a noun = small thing. Basic root of these is [niin] .See Galab (Dasenech) [nini], Yaaku [ni$^{?}$in], Qwadza [nina-kw] .
Son	nálebà . See 'boy' above.
Speak, talk	an-d'éđeya .
Stand, to	árkè .
Star	úyù . Another worn down word. Probably from [*Huzuk]
Sun	ááwête . See Arbore [$^{?}$áwaté] 'sun'.
Sunset	ráu . More exactly it is time of sunset. Can this be related to Old Egyptian [r^{c}] 'sun' or Hausa [raanaa] ? Or Iraqw [lo^{c}] ? Maybe!
Sunset (time)	awátáníyite . Literally close to 'the sun has gone down'.
Ten, 10	tômôn, tomon . Cardinal number. See Rendile [tomon].
Testicles	gíir .
Thigh	ráa .
Three, 3	séébe . Cardinal number. We don't know where the [b] comes from; the form is aberrant. See Rendile [seeya], which is also aberrant but regular in its change from [*d] to [y]. Se Oromo [sâddi] 'three' or Somali [siddêH] .
Thirteen, 13	tómon-o-sée . Cardinal number. See Rendile [tomon-ičo-séya]
Tired	anáuwei . Probably a verb form
Tongue	êrrêb=. [b=] is unaspirated. See Rendile [Harab=]
Tooth / teeth	ilko-tóxo / ílko . Interesting departure from East Cushitic pattern, where the base form for tooth is the singular and the plural is a suppletive. See Rendile [ilko] and [ilaH] = 'tooth' and 'teeth'.
Tree	ór . See Rendile [or] 'one stick of firewood' (in one context only)
Twelve, 12.	óólááma (or) tómon-ó-lááma . Cardinal number. Sharp distinction from '20', q.v. See Rendile [tomon-íčo-lama] '12'.
Twenty, 20	tomon lááma. Cardinal number. Contrast with '12'. See Rendile [tomon-láma]
Two, 2	lááma. Cardinal number. See Rendile [láma].

Urine	ansénе. Suspected by Beaman of being a verb form, hence [an] is a prefix.
Vagina	gel. See Rendille [gel}.
Wait, to	éssé. What aspect?
Wake, to	aŋ-kée, aŋkée. Second form is the citation form. See Rendille [kaH] “get up”.
Walk, to	aŋ-íita, aŋ íita. Second form is the citation form. Root may be [giit] but see Arbore [$^{?}$î$^{?}$ît].
Want, to	‘I want’ = [wántaaba]. And ‘yesterday I wanted’ = [eelé wántaba]. Somewhere in here is the root for ‘want’, oddly enough practically the same as English.
Water	bíče. See Rendille [bičé].
Wet	dafar-ábis. Beaman says it probably equals ‘wet cloth’, where [dafar] means ‘cloth’, as in Rendille.
White	êwê, êwuda. The second is the citation form, the first form given. Beaman is the one who elicited the [ewe] form. The [-da] probably is a copula or such. See Arbore [ez] for [w] = [z] correspondence.
Woman	sáale.
Wrist	béeč
Yesterday	eelé . See Rendile [čelé]. Since these forms ultimately come from proto-East Cushitic [*kele], the initial El Molo form may be [*$^{?}$eele].
Young	nyarðida. See Rendille [nyarnyar] = ‘bride’.

Final note: El Molo is finally classified as the third member of a group which some call ‘Galaboid’ and some call other things. It is in a triangular relationship with Arbore and Dasenech (Galab) as a sub-group of Lowland East Cushitic, roughly interstitial between the Oromoid and Somaloid clusters. For those who might want to consult about El Molo or her primary specialization, Rendile, Ann Beaman’s address is:

Dr. Dr. Ann Beaman, 35 Alpine St., Gorham, New Hampshire 03581-1230, USA

For those hoping to find some native speakers still alive in El Molo country, we can give some odds. When Heine visited in 1971, he was able to find four informants, two from one locale and two from another. He said that they all seemed at least fifty years old. Ann Beaman, visiting seven years later, found two informants, both ‘elderly’. What are the odds that any of these informants would be alive 32 years later? Nobody knows for sure but it would not be extraordinary to find an old man in his eighties or nineties still around. Unless he has turned to stone!

Mesmes and MLB

As one member of the so-called Gurage group of Ethiopic (Semitic), the Mesmes [mêsmês] community was surrounded by the Hadiya people of Highland East Cushitic. Located in the south central Ethiopian highlands between the Great Rift Valley and valleys of the Omo river system, or the water shed between both, Mesmes was about the most southern of all the Semitic languages of Ethiopia, except for Amharic which was the official or national language of the whole country. Arabic too, an Asian Semitic language, was spoken farther south, by virtue of its sea-faring and religious activity, literally along most of the eastern coast of Africa.

Mesmes escaped notice because it was seen as a variety of Inor or Ennemor or Endageñ , three close dialects of the southern variety of Gurage, the southwestern branch of South Ethiopic or Ethiopian Semitic. The term "Gurage" was itself a misfit because it originated as an ethnonym used to designate a bunch of small Ethiopic tribes found south and southwest of the Amharas of central Ethiopia. Some like Soddo were linguistically closer to Amharic itself than to the others. Others like Silte, Walani, and Zway (spoken on Lake Zway in the Great Rift Valley) were clearly closer to Harari than to anyone else. And finally a loose cluster in the southwest, centered around Chaha, seemed to constitute a proper taxon which could deservedly be called 'Gurage'.

It was the possibility of finding yet another breed of Semite south of Chaha that may have inspired the late Marvin L. Bender to decide to record some of Mesmes. Supposedly there was some publication of Mesmes data in the Semiticist literature but we were never able to find it and had to conclude that Mesmes was for all practical purposes unknown until Bender's field work. Bender published a Swadesh list on Mesmes in 198- by means of a circulated manuscript. That revealed a variety of Ethiopic obviously close to Inor and Chaha but one with unusual phonetic properties which invited further investigation.

That desired investigation was undertaken in 1989 by a team from Addis Ababa University which also called on 'Galila' another Ethiopic language spoken around the crater of a volcanic lake in western Shoa province. Galila which had some ties to extinct Gafat of Gojjam had expired entirely when the team got to the crater. Although disappointed by the failure to find any Galila, the team renewed its spirit by hoping to have better luck with Mesmes which was not located terribly far away.

It was a sad-faced informant, a Hadiya, who disappointed the Addis Ababa team's high hopes. The last speaker had died only a year or two ago. Also there had been some sort of Bible written by some Mesmes elders but that too had disappeared. So Mesmes was extinct and no one knew of any survivors. Alas, too bad!

Accordingly, for the same reasons that both Bender and the Addis Ababa team had sought Mesmes data, we here present Bender's original Swadesh data, lest Mesmes be entirely forgotten. The reader will note the interesting phonetic correspondences between Mesmes and the well known Semitic languages of Asia, as well as Ethiopia. For ease of comparison we include data from Ennemor, a close relative of Mesmes, and Geez the oft mentioned equivalent of Latin for Ethiopic.

	I	**THOU**	**WE**
Geez	$^{?}$ana	$^{?}$ant-a/-i *(f)*	nîHna
Ennemor / **Mesmes**	âya / hiyya	axa / ahâ	iṇa / îna
	Two	**Three**	**Four**
Geez	kel $^{?}$etu	šêlas	$^{?}$arba^{c}
Ennemor / **Mesmes**	wur$^{?}$et / wû$^{?}$êêti	so$^{?}$ost / soosti	arb$^{?}$at / **?**
	Eye	**Nose**	**Tongue**
Geez	^{c}ayn	$^{?}$anf, Hîlbat *(nostril)*	lîssan
Ennemor / **Mesmes**	êên / îîn	anffuna / anfûnna	(anâbâd / annôôda)
	(Borrowed from HEC or Highland East Cushitic *arrabat)		
	Knee	**Drink, to**	**Name**
Geez	bîrk	satya, rawaya	sîm
Ennemor / **Mesmes**	(gwurmand) / (gûnnooda)	sêč'ê-m / sêčâ	šũ / šum
	(Borrowed from HEC)		
	Blood	**Heart**	**Mouth**
Geez	dam	lîbb	$^{?}$af, kanfar *(lip)*
Ennemor / **Mesmes**	dâm / dô	xyin / nuuba	ãfw / anfe
	Bone	**Horn**	**Tail**
Geez	^{c}at'm	qarn ~ k'arn	zanab
Ennemor / **Mesmes**	a$^{?}$îm / hãuwa	k'ên / kônna	jî`wê / juu$^{?}$e
Moroccan Arabic	^{c}Dem	qern	šuwwal
	EAT (to)	**BITE (to)**	**TOOTH**
Geez	bal^{c}a	nakasa / nasaka	sînn
Ennemor / **Mesmes**	bân$^{?}$â / ba$^{?}$na	nks / nks	šân / sîîne
	BELLY	LIVER	**BREAST**
Geez	kabd , karś	kabd	t'îb
Ennemor / **Mesmes**	kâs / kôssa	xârt / fôre	t'u / t'uwye
	HAIR	**HEAD**	**FEATHER**
Geez	šî^{c}îrt, s'agwr	re$^{?}$es	s'âgurâ
Ennemor / **Mesmes**	gu$^{?}$nêr, dîgâr / dugûûra	gu$^{?}$nêr / gûnnure	zâwîyâ / zâwyâ *(Gyeto)*
	HEAR, to	**EAR**	**LEAF**
Geez	sam^{c}a	îzn	k'wasl
Ennemor / **Mesmes**	sâm$^{?}$a / sô$^{?}$ma	înzîr / ûnzuura	kâ$^{?}$âr, înzîr / ko$^{?}$ora
Moroccan Arabic	sme^{c}	wden	hašiš

	FOOT	**HAND**	**CLAW**
Geez	$^{?}$îgr, $^{?}$ašar *(print)*	$^{?}$îd	s'îfr
Ennemor / **Mesmes**	âgîr / îggîre	âčč / îjja	$^{?}$ãfâr / ûnfura
Moroccan Arabic	izhel	idd	Dfer

	Bar k (Tree)	**Skin**	**Neck**
Geez	lîHis'	ma$^{?}$îs, $^{?}$anada	kîsad
Ennemor / **Mesmes**	xãra / hanna	gogâ / googa	angâd / angôda

	All	**Full**	**Many**
Geez	kwîllu	mâl?a	bîzuux
Ennemor / **Mesmes**	înnîm / ôttêmi	mur$^{?}$a / ?	nu$^{?}$, bâzza-m / k'ok'o
Moroccan Arabic	koll	^{c}emmer	bezzat

	Big	**Long**	**Far**
Geez	^{c}abiy	nuh, nâwi, nawwix	rîHuk'
Ennemor / **Mesmes**	îmmiyâ, fuz / k'ôk'ô	deka, fat'ura / gûddôr	? / ?

	Small	**Thin**	**Round**
Geez	nî$^{?}$us, His'us'	k'at't'in	k'ibb, Halik'
Ennemor / **Mesmes**	îns, bîskad / ûûnse	? / ?	mumwa, xuwu / ?

	Black	**Green**	**Red**
Geez	s'allim	Hamalmil, śî^{c}ur	k'ayiH
Ennemor / **Mesmes**	dî$^{?}$ur, gêmbêna / gômbônna	sa$^{?}$ar-yîmâsir / ?	biša / biiša

	White	**Yellow**	**Good**
Geez	s'â ^{c}ada	bes'a	sênnai
Ennemor / **Mesmes**	gwaad, nê$^{?}$â / gâde	wiit'a / wet'a *(Mesq)*	wâxe, ker, mo$^{?}$ / mo$^{?}$o

	Ashes	**Earth**	**Sand**
Achaemenid Aramaic	rimSa *(embers)*	$^{?}$ra^{c} / $^{?}$raq	
Geez	Hamad, ramaD *(hot ashes)*	mîdr	xos'a, (ramal)
Ennemor / **Mesmes**	amãnd / hawênda	afer / ?	ašawa / t'oona
Moroccan Arabic	rmaD	lerD	ramala *(Hemat)*

	BIRD	**FLY, to**	**DOG**
Geez	^{c}of	berra, sarara	kâlb
Ennemor / **Mesmes**	ãf / ôônfa	bnr / ?	gĩye / giiye

	FLY (bug)	**LOUSE**	**FLEA**
Geez	zinb, s'îns'inya, $^{?}$aqaron	k'wimal	k'wins'
Ennemor / **Mesmes**	? / ?	$^{?}$î mar / k'uwana	k'îrăč' / ?

MOTHER TONGUE
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	Burn, to	**Warm**	**Fire**
Geez	nêddê, wiyê	mîwok’, wâk’a	$^?$îsat, Haw
Ennemor / **Mesmes**	ntd, mkyr, tks / totosô-ye	mwa$^?$â, win$^?$a / ma$^?$ay	îsad / îîsaade

	CLOUD	**SMOKE**	**RAIN**
Geez	dammana, gime (fog)	t’is, tann	zanama
Ennemor / **Mesmes**	damãra / doona,	tân / tonna	diyâ / diiye
Ennemor	gunje$^?$â *(fog)*		
Mesmes	gũwâ *(fog)*		

	COLD (air)	**WET**	**WATER**
Geez	kwarra, bîrîd	bîlul, rît’ub	maay
Ennemor / **Mesmes**	wîrk’a, zîza / ziizâ	iiya / irramo	îxa / $^?$ûha

	Come, to	**Go, Walk, to**	**Road**
Geez	bo$^?$, $^?$tw, ms’$^?$	Hoora, rgd	fîno-t, mangad
Ennemor / **Mesmes**	ma$^?$a, yêxê / mma$^?$a-ye	wârâ / hôrôô	meya / mooya

	DIE, to	**KILL, to**	**SLEEP, to**
Geez	moota	k’atala, gdl	nooma, Halama *(dream)*
Ennemor / **Mesmes**	moodê / môtô	$^?$êtêrê / ôôtôrô	ne$^?$â, tê-gêtêrê / wôdô$^?$ô

	Meat	**One**	**New**
Achaemenid Aramaic	bśar	Hd	?
Ma^{c}lula	besra	aHHað	Hačč
Phoenician	bšr, š$^?$r	$^?$Hd	?
Epigrap.So.Arab. (Sabean)	bśr	wHd	?
Geez	(sîga)	aHad	Haddis
Harari	bâsâr, jaw	aHad	Hajis
Silte / Walani	bâsâr /bêsêr	ad / $^?$âdd	hajis / ájis
Ennemor / **Mesmes**	bâsâr / bôsôra	at / haati	wêya / wayyamo

Geez (sîga) Borrowed from Agau (Cushitic)

	Dry	**Egg**	**Fat, Oil**
Geez	yîbus, nîk’us’, ^{c}îbur	($^?$înk’ulalih)	šibH, k’îb$^?$, salit’
Ennemor / **Mesmes**	dârâ$^?$, dânâ$^?$â / dâroe	unk’ulla / k’uura	sûw$^?$â / (č’oma)

Geez ‘egg’ is usually seen as a borrowing from Agau, as might Ennemor’s ‘egg’. Mesmes ‘fat’ is borrowed from Oromo, as is Amharic’s usual word for ‘fat’.

	FISH	**SWIM, to**	**GIVE, to**
Geez	^{c}aša	Hammas, s’abat	whb, mât’âwe
Ennemor / **Mesmes**	asa / **?**	dênêgê / wa$^?$a	amã / hamô

	KNOW, to	**SEE, to**	**SAY, to**
Geez	$^?$a$^?$mara, ^{c}ook’a	rî$^?$ya	bîhla
Ennemor / **Mesmes**	xàrâ´-m / haroo	ašâ / haayyô	barâ / beñô

	Lie Down, to	**Sit, to**	**Stand, to**
Geez	gâdêm'a, tagêdfâ, rafak'a	nabara	k'omâ
Ennemor / **Mesmes**	tâ-gâtârâ-m / ?	čânâ / č'ônaa	tâ-šâkâbâ / tâ-šâkkô

	Man (Vir)	**Person**	**Woman**
Geez	^{c}îd, bî$^{?}$si	bî$^{?}$si	bî$^{?}$siit, $^{?}$anîst
Ennemor / **Mesmes**	mîs / ?	sêw, sêb / sâwye	i˜ča, ãst, mîš / êênsta

	MOON	**SUN**	**STAR**
Geez	warx	daHay, $^{?}$amir	kokab
Ennemor / **Mesmes**	bêñê, dana$^{?}$a *(light)* / dânna$^{?}$a	î˜wê˜yê / imee	xwâxwâb / hõhõye
Moroccan Arabic	gemra	šems	nezhma

	Mountain	**Stone**	**Tree**
Geez	dabr	$^{?}$îbn	^{c} îD, ^{c}om
Ennemor / **Mesmes**	k'wêto / aanya	îmîn, îmîr / ouna	e$^{?}$á / ye$^{?}$e

	Night	**Root**	**Seed**
Geez	lelit	šîrw	zîr$^{?}$, bîzr
Ennemor / **Mesmes**	mîša$^{?}$arê / hawônšôôdê	âsîr / k'iine	zîn$^{?}$â, zêr /zuriyê

	That	**This**
Geez	wî$^{?}$îtu (m), yî$^{?}$îtu *(f)*	z, za *(f)*
Ennemor / **Mesmes**	aa, ha, xa / ?	waa / wûû

	WHAT?	**WHO?**
Achaemenid Aramaic	maah	man
Ma^{c}lula	moo, ma *(Arbel)*	moon, mánni *(Arbel)*
Phoenician	m	my
Epig.So/Arab. (Sabean)	mhn	mn
Geez	ment, mii, mint	mannu, ay, aynu
Harari	min	man
Silte / Walani	mîn / mîn	maa / ma
Ennemor / **Mesmes**	mîr / mûn	maan / homun-e

A final note on phonetics: In MLB's data there is a real possibility that his written [ô] is not the lower back labial vowel, as in English 'awe' or 'caught', but the higher more common [o] as in Italian 'dopo' or French 'eau'. We believe that the problem derives from his American dialect. When he heard [o], he thought he had heard [ô] or something like that. There are serious differences among Americans in handling these two sounds. The evidence backing up this observation is the consistent differences between Marvin and other scholars; when they heard [o] and wrote [o], he would usually write [ô].= [ɔ]

In our script the symbols [â], [ê], [î], [ô], [û], and [õ] represent the 'short' vowels of English and a nasalized [o]. Capitals [T], [D], and [S] represent emphatic consonants of Asian Semitic; their counterparts in Ethiopic are glottalized, [t'], [d'], and [s'].

The Mystery Languages of Old Tanganyika and Kenya

There are also languages which remain taxonomic mysteries, even though being well known in one respect or another. Examples such as Meroitic, Minoan B, Etruscan, and 'the Indus Valley script' fascinate us but remain unconquered, although Meroitic may soon be classified properly. Our colleague, Harald Sverdrup, has recently shown people word lists in Etruscan which portend an accurate classification soon.

But we also have languages which have a little data but are so unknown or disregarded that hardly anyone knows about them and no one works on them. Or they are genuinely hard to peg and initial efforts have been completely unrewarded. We will examine three of these languages in eastern Africa without this implying that such things cannot be found elsewhere. One can remember when Kusunda was a similar case in Nepal.

The first language we propose to present has no name, other than **'Ndorobo, Serengeti'** which is the ordinary Masai word for hunter-gatherer plus a location in the great plain of Serengeti in northern Tanzania. We propose to call them the **'Serengeti Dorobo'.** In that huge natural hunting ground there seems not to be another Dorobo group, at least no other is reported.

Their language feels like a Nilotic language, like Masai or Tatoga (Taturu), and a few words point in those directions. Here the data are not presented in word lists, but in texts, with the added benefit of all the primary numbers.

Those numbers are: 1 = **napu**, 2= **ennya**, 3=**uni**, 4=**ongwan**, 5=**mot**,
6=**lei**, 7=**oner**, 8=**sissie**, 9=**naudo**, and 10=**gaget**.
Number 15=**gaget ax mot**, 20=**tegenos**, 30=**tegenos ax gaget**

'*One*' is the same as an alternate in Masai and Lopit a related Nilotic language.
'*Two*' resembles Nilotic Tatoga's [**iyen**] and another Dorobo's [**ayin**].
'*Three*' resembles Nilotic Teso's [**iuni**] , Turkana's [**auni**]and Dongotono's [**uni**].
'*Four*' is a straight-forward Nilotic form, whether Northern like Shilluk or Southern like Tatoga. The Masai form is virtually identical.
'*Five*' is a clear South Nilotic word, as in Kalenjin [**mut**], also found in Lotuko [**miyat**].
'*Six*' while found in some Nilotic languages, is a borrowing from Cushitic in them.
'*Seven*' does not find any plausible look-a-likes in any local groups.
'*Eight*' looks like an East Cushitic term in origin but specifically matches Nilotic Tatoga's [**sise**], itself probably borrowed from Cushitic of southwestern Ethiopia.
'*Nine*' does not find any plausible look-a-likes in any local groups
'*Ten*' is a great surprise, since so many languages have a variant of ancient [*tomon], again ultimately from Cushitic.

As is well known, the four primary low numbers, especially 2-4, are very conservative and one of the best indicators of genetic relationships. The upper primary numbers, 6-9, are famous for being borrowed or in reflecting peculiar innovations. If not borrowed, however, they may reinforce conclusions based on the lower numbers. In the present case the testimony of the lower numbers –that this Dorobo is a Nilotic language – is not supported by the upper numbers but not contradicted either. 'Seven', 'nine', and 'ten' shed no light while 'six' and 'eight' argue for Cushitic or a Nilotic language with Cushitic borrowing. Both local Nilotic languages, Masai and Tatoga, do so qualify.

If we then conclude that the numbers favor a Nilotic connection, we do not know which branch of Nilotic. Moreover the textual data --despite the fact that they 'feel' like Nilotic –do not favor any conclusion. Those data are presented now:

> [Ehorra evehóssore eméta emehoréta imidátene evoharyét
>
> engirie koraá engátena háho panawádada gigu utie kiutïe
>
> leïdos moo egiténaha hamúmia enoloïdugo nadodoivire
>
> kodonuha]

We are told that **[enoloïdugo]** means 'zebra'. This form shows up in local Nilotic languages, but without the [en-] prefix or initial phones. We do not find it in Nilotic languages north of Kenya, nor in Cushitic, Hadza or Sandawe. Or Bantu.

The translation of the whole text is given first in German, the language of the field worker, and then in English.

" Wir gangen aus und trugen unsere Pfeile und Bogen und Köcher. Wir gingen bis zu einem Baume und blieben: Wir machten eine Einzäunen und liessen 2 Mann dort zurück; wir sahen Zebras. Hier gingen 10 Man, dort 10 Mann, und umgingen das Wild. Die Zebra waren darin und wurden getödtet. "

Our English translation, perhaps not completely accurate, is as follows:

" We went out and carried our arrows and bows and quivers. We went up to a tree and rested. We made an enclosure and left 2 men there behind. We saw zebras. Here went 10 men, there 10 men and surrounded the game. The zebras were therein and were killed."

There is a structural problem to begin with. The Dorobo appears to be one sentence. The German response is five sentences and the English six. So the field report is not too helpful syntactically.

The second Dorobo 'sentence' is as follows:

> [Nagenavéna kavendá gawédia totowó kióno kinávesik kiono
>
> kinevésse tégenos kisilie kópowa hádanyen kópowa damaréta
>
> hádanyen kópowa damaréta daveïe, daveïe kaldeni kanda
>
> kinevésse ártam .]

The translation, again in German, is as follows:

"Wir gingen kampfen, bekamen Rinder, tödteten 20 Mann. Als wir ins Dorf kamen gaben wir 10 Rinder dem Zauberdoktor."

Our English translation is, as follows:

> “We went to war (raid), got cattle, killed 20 men. When we came into the village, we gave the shaman/witch doctor 10 head of cattle.”

We are also told that [kinavéta napó] equals ‘ein Rind’ or ‘one head of cattle’. That plus the numbers is not enough to classify this Dorobo. There are almost no other words which can be related to words in other languages, with the exception of 'zebra' . Everything seems encrusted in a mass of prefixes and suffixes; that is what gives the ‘feel’ of Nilotic. But of course we do not know exactly which affixes are present. East African ‘Dorobo’ groups include representatives of each major phylum in Africa, except Bantu, so that no one language group can stand securely as a model for unraveling this Dorobo.

We have not been able to classify this Dorobo. We probably could finally figure out the structures and thus reveal the lexical morphemes but we reckon that would take some time. It will take someone with a flair for decoding messages or a love of syntax or morphology to crack this code.

But someone will do it, now that the matter has been presented to a wider audience. It is even possible that she who masters the Serengeti Dorobo will win the Bomhard Prize for this year or the next. Let the games begin!

Mystery Language or a Fake? The Case of Oropom.

There was a small uproar in the circles of Africanist historical linguists a few decades ago because an important new language seemed to have been discovered in Kenya. Apparently its name was **Oropom** and also apparently it was fairly easy to detect the presence of words of Nilotic, Cushitic, and possibly Bantu origin in it. What could it be, everybody wondered.

We will not cite chapter and author at this juncture because the matter is somewhat controversial and we do not want to hurt anybody’s feelings. Suffice it to say that our good friend, Bernd Heine (he of El Molo presence), alerted us to the problem and forwarded the relevant data to us. We will present that data forthwith and let our members judge for themselves whether this is a real language or, as some have maintained, Oropom is a hoax, i.e., a fraud. One thing to bear in mind is that authors of the Oropom hypothesis said that it was a matter of Oropom Bushmanoids having language, cultural and religious borrowings from dynastic and pre-dynastic Egypt.

The data follow: Note that the initial consonants in each word are capitalized.

Man	Muren	Meat	Apintoo	Fire	Emaa
Woman	nakwanta	Milk	Coko	Sun	Aca
Child	Muto	Food	Araukoo	Moon	Pele
Father	Mamunyu	Oil	Konoye	Day	Awar
Mother	Iyoo	Fat	Moda	Night	Riono
Brother	Lukiya	Cooking Pot	Kodo	Rain	Lat
Sister	Pese	Black “ “	Kiriente	House	Apirgoo
Old Man	Kuko	Grooved Design on Pots	Nacipa	Tree	Telegai

Old Woman	Kukuye
Mother-in-Law	Yo
Warrior	Lim
Enemy	Bu
Thief	Mokorat
Fool	Bung
Clever Person	Woth
Seer	Murwe
Wizard	Rimirim
Witch	Ariet
Dog	Kokuye
Cat	Ariet
Cow	Ngobo
Bull	Losogol
Cattle	Pange
Goat	Ngoror
Sheep	Merek
Lion	Ru
Leopard	Meri
Gazelle	Tuth
Eland	Ongor
Snake	Kwolta
Crocodile	Moro
Fish	Karu
Egg	Iken
Honey	Madik

Eye	Kongiye
Nose	Torom
Ear	Ki-ito
Tooth	Ne-et
Breast	Kisina
Penis	Oyaa
Vagina	Kibunte
Hand	Akeleng
Foot	Apaukoo
Hair	Akopito
Cowrie Shell	Pel
Mark on Forehead	Nageran
Ear-ring	Napiroi
Neck Bangles	Gorom
Woman's Apron	Ongor
Stone Wrist Bangle	Aurare
Spear	Ngokit
Arrow	Motit
Bow	Terema
Soil	Nyapid
Chalcedony	Atunatun
Water	Lata

Grass	Purung
White	Pele
Black	Timu
Red	Kopurat
Blue	Puthia
Good	Pau
Bad	Girito
Hard	Keter
Soft	Lujuk
Dry	De-au
Wet	Ret
To sleep	Sanan
To walk	Pauwo
To swim	Redik
To dig	Chege
To cut	Tubo
To sit	Paja
To lie down	Lura
To give	We
To receive	Aruka
To cook	Ipo
To burn	Mala
To boil water	Mak
To speak	Dokol
To marry	Ritha

There is the evidence presented in support of Oropom, a language of eastern Uganda, and the claim that it is a spoken language or was one, with ample prehistoric qualities. Your task is to judge it, evaluate it, and try to classify it. It will be of great interest to us if you send in your opinion or judgement of the matter. We will announce the results, as soon as an appreciable number of opinions reach us.

The language of the Pigmies of Gemu-Gofa: A frustrating Mystery!

Ever since foreigners contacted Africa's Pigmies there has been conjecture about their original language. Once it became apparent that the only languages associated with them were those of the ordinary Africans living near them –once that became even obvious –scholars searched for or hoped for something that wasn't a variety of Bantu or the Central Sudanic branch of Nilo-Saharan. What was the original Pigmy language like?

In the Congo there were charlatans who bilked tourists by suggesting they could buy some records of authentic Pigmy speak. And so forth. But still no successful attempts to find a pre-Bantu Pigmy language could be found. Yet in Gemu-Gofa province of Ethiopia, down near Lake Rudolf, someone had reported seeing Pigmies and another field worker had recorded some words of their language. And most of this more than a century ago!

The visual report was made in 1895 by an American, Donaldson-Smith, whose report was either disregarded or disliked by several generations of anthropologists. They reported honestly enough that they had seen no Pigmies nor had anyone that they talked to. While there had been reports of Pigmies by explorers even earlier than Donaldson-Smith, nothing substantial was found by 20th century explorers and field workers.

The one exception was the research by L.L.Cavalli-Sforza on the Manjo of Kafa province, across the Omo river from Gemu-Gofa, and farther north. Since Kafa province still had quite a bit of rain forest left, the reports that the Manjo were either Pigmies or at least 'Pigmoid' was received less critically by his colleagues. Luca and his associates found genetic material on the Manjo which clearly established them as Ethiopians but left open the possibility that there was another component in the Manjo genes. Nothing else ever came of this report, except to establish that the people of a well-known despised caste of southwestern Ethiopia were indeed Ethiopians, but clearly not Sudanese as some theorists had proposed.

Into this scene comes the other report on Pigmies in Gemu-Gofa. Published by a very well-regarded scholar, Conti Rossini, in 1927, and based on field work, even if ever so brief, the report has to be taken seriously. The report lists the first ten numbers of a language called 'Dima'. No one else has ever reported on a Dima tribe, although not too far to the west lived, and lives, a people called 'Dime'; they are Somotic (South Omotic) speakers and have no traditions of ever coming from the east. They are all normal sized Ethiopians. Most of all their numbers are totally different from those of 'Dima'.

For the sake of contrast we here present the 'Dima' numbers, along with those of the Somotic Dime and formerly close neighbors of the 'Dima', the Ongota. Here they are:

	'Dima'	Dime	Ongota
One	ekka	wokêl	akala
Two	ekkina	k'astên	(lama)
Three	dasa	mâkkîm	(zéxa)
Four	dandasa	uddu	talaxa
Five	osa	šîîne	(hobbe)
Six	osakar	(lah, lax)	s'anafa
Seven	fas'ā̃	(tússum)	(taxanke)
Eight	orongo	k'ašnaš	íísta
Nine	keriri	wokêlaš	(gólanke)
Ten	kepes	(tâmmâ) (?)	čoma

Just to make the comparison easier we here repeat the Serengeti Dorobo numbers.
1 = **napu**, 2= **ennya**, 3=**uni**, 4=**ongwan**, 5=**mot**, 6=**lei**, 7=**oner**, 8=**sissie**, 9=**naudo**, and 10=**gaget**.

It is obvious, perhaps, that the four sets have little in common but that Dime and Serengeti Dorobo do share 'six', due to both having borrowed it from East Cushitic. While Dime has two or three borrowed higher numbers, and Ongota has five borrowed numbers, they have been borrowing from different branches of East Cushitic. Dime's 'ten' is possibly not a borrowing from widespread [*tomon], but rather a cognate, given its high frequency in Omotic. Ongota violates the expectation that lower numbers will be conservative but that is probably due to its presently moribund situation vis-à-vis Tsamai and Hamar, two overwhelming neighbors.

It is indeed unfortunate that Conti Rossini did not report, or was unable to report, more on the 'Dima'. Not only because he was such a great field worker but also because 'Dima' has numbers which come closer to being a real Pigmy language. We want to test this judgement against those of you, our colleagues. You are invited to comment!

Our logic is simple. 'Dima' as a language has a set of numbers quite unlike any in its area and a 'logic' of building numbers which seems distinct from others. It seems to be unrelated to any other language –period. To the sceptics of 'mere numbers' we must point out that in (probably) most languages the genetic affiliation is normally discernible in its primary numbers. Is there an IE or an Altaic language, for example, that violates that expectation? The theorists of historical linguistics have cast such doubt on these simple lexical sets that most people overlook their usefulness. At least that is what we argue.

Apropos of genetic connections in this part of Africa a large molecular genetic study of those groups we have been discussing in Gemu-Gofa and Kafa provinces, especially the 'outcaste' or 'artisan' groups, has been done by a colleague in London who wishes to share those data with us. As of this date we have not been able to organize the outcome properly and it may have to wait until next year. But one primitive and open result is that the DNA of one Somotic people, Ari of Jinka, is distinctly different from that of its 'outcaste' group. The rest of the report is eagerly awaited! One must point out, however, that one original population which split socially into 'normal' and 'despised' groups could have evolved into two distinct populations, given enough centuries of social isolation from each other.

Down to two separate memories: Lexicon sans grammar.
Garo or Bosha: Trapped in Yemsa-land

No one knows for sure who got up on top of the beautiful mountain ridge first but the two lived peacefully together in recent times. Delightfully cool but sunny with verdant landscape the main area nowadays called Janjero is one of the sweetest places in eastern Africa. Adjoining on the ridge is a district called Garo. Here was found a language called 'BOSHA', a variety of Kafa usually considered one of its key dialects along with Mocha on the west.

One unusual feature of Bosha was that it had never actually been recorded by any of the authorities who mentioned it.. A second feature was that Bosha had died out before anyone ever recorded it, while thirdly it was completely (totally) embedded in Oromo society, i.e., the Jimma Oromo people who were actually Muslim but thoroughly dominated Garo and other districts between here and Jimma city. During subsequent research here no informants were found to speak Amharic. Fortunately, one member of the team, Taddese Gamada, was himself an Oromo from Wallega.

It was here that we learned of the important distinction between a language which has died out socially and one which only exists in individual heads, there being no mutual communication in that language. Bosha did not exist anymore as a community of speakers, yet in three different locations individual isolated speakers were found. It also turned out that an individual speaker had been located a dozen years before that in Jiren

(Jimma) by Herbert Lewis, an anthropologist doing field work among the Oromo of Jimma. Like everyone else Lewis assumed that Bosha had already been reported in the literature

In 1972 the team from Addis Ababa University had gone to Garo more or less by accident because during a visit in Janjero (Yemsa country) they had been told to look in Garo for Bosha informants. This information took the form of –"did you guys know that a language like Kafa used to be spoken in the next district, Garo?" One can imagine the response to that!

When first they went to Garo, they drove through the district about 24 kilometers to a lumber camp at the end of the district. On the way they inquired of 35 or 40 people about the presence of a Bosha language. Nobody knew much of anything. At the lumber camp the team turned around to go back to Addis, when by good luck they found an informant. This was a woman of around 60 years, named Makka$^{?}$a Liban, who had not had a conversation in Bosha for many years and for all practical purposes was now an Oromo. This woman, who we will call **ML**, could only remember 32 words and/or phrases She tried hard but the words did not come to her. Bosha was moribund in her head. Her grown son of 35-40 years did not know Bosha at all.

What she gave was nevertheless clearly identifiable as Kafa or a dialect of it; her words are repeated here:

'one'	ikka	'two'	gutta	'mouth'	nóóno
'water'	haač'o	'my father'	taa-niho-čo	'my mother'	ta-$^{?}$înde
'eye'	aafu	'hair, head'	tommo	'my foot'	tâ-t'ammo
'foot'	t'ammo	'breast' (f)	t'ano	'nose'	sit'o
'meat'	meeno	'injera'	mat'ino$^{?}$	'tree, wood'	mit'o
'sheep'	(bago)	'cow'	miimo	'tobacco'	tambo
'small'	giisiči	'my shoulder'	ta-gubbo	'run and go!'	kate hambe
'tooth'	gâ´so	'belly'	mač'o	'fire'	k'aak'o
'come quickly'	kate wobe	'hey you!'	hínahó (Oromo = ilamme)		
'rain is coming'	amióó wate	'earth gets dark'	deč'o t'umete		

Note" 'Injera' is bread, unleavened, flat and round, usually from 't'eff' grain (Eragrostis sp.). 'Sheep' is from Amharic, probably borrowed a century or two ago.
Makka$^{?}$a Liban (ML) could not count above '2' in Bosha. She knew no Amharic.

One day later they found another Bosha speaker, a bright old lady of about 93 years, named Tiifu Abba Jobir, hereinafter **TAJ**. She was a child when Menelik came to conquer and she remembers Jimma Abba Jifar, in those days king of the Jimma Oromo. She said that in her childhood there were few Oromos in Garo. Also in those days the Janjero (Yemna) lived farther away to the north than they do today, i..e., some of northern Garo has been settled by southern Janjero. Also across the Omo lived mostly Gudella, a variety of Hadiyya, but the Bosha knew nothing of the Gurages. On the south the Kullo sometimes came and fought with the Garo (Bosha).

Relations wiith the Kafa were different. It was recognized that Garo was of a different seed from the Kafa but that both spoke a language which differed only a little as between Garo and Kafa. Their religion was also very similar. However, Garo had their own king. He and the Kafa king respected each other but each ruled their own land.

Also she said there were 'Fugas' in the old days and they spoke Bosha. This becomes important when we come to the third informant.

Later on the team gave her son a ride down to Nadda on the main road from Addis to Jimma.He was himself elderly, maybe 60 or 70 years old. He was also 'balabbat' of Garo, roughly feudal lord or chief, at least of northern Garo. He was a speaker of Garo, in fact more than the first informant, ML. Even though he said his seed was Garo (Bosha), he was clearly an Oromo in language and culture. And a Muslim. A voluble, likeable man, who invited the team to come back and swore long friendship, he also expanded a great deal on local history.

He said that Garo had in fact been conquered by Jimma Oromo circa 140 years ago, judging from what his father had told him. Jimma Abba Jifar had also told the Bosha to quit talking Bosha. Henceforth they were to speak Oromo. Menelik's conquest then came a generation or two after the original Oromo conquest. At first Bosha religion was like Kafa, resembling Christianity in some points, but later of course the Bosha became Muslim.

He said 'Fugas' had come in with Oromo and Janjero immigrants, that the Bosha had few of their own. This contradicts his mother's statement . The Bosha regard the 'Fuga' as unclean people who eat the Gureza monkey and the Chano monkey and such like. They cannot enter Garo houses, cannot marry Garo people, and are despised. But the Bosha do not fear their magic or curses or what-not. All this seems to be a good description of 'Manjo', more than 'Fuga', and indeed the old lady, TAJ, had used the word 'Manjo' when she was asked about 'Fugas'.

By the way, the team noted that the Oromo of Garo tend to be 'red' and of medium height, lean, and quite 'Hamitic' looking. Basically, they look like Oromo of Jimma, as well as the Yemna (Janjero), the Hadiyya, and 'Gurage'.

TAJ's data were much more useful, with many items checked several times for accuracy. As mentioned before, she spoke no Amharic. She gave 126 words, as follows:

One	ikko	Sister	mise	Brother	eeso
Two	gutto	Throat	gêto	I	taane
Three	kejjo	Hair	tommo	Thou	nen
Four	awddo	Belly	maač'o	He	itto
Five	uučo	Lung	k'amo	She	?
Six	(sîrítto)	Heart	k'amo (?)	We	?
Seven	(sabato)	Liver	k'amo (?)	You *(PL)*	?
Eight	(simmito)	Ear	waamo	They	?
Nine	(yiit'io)	Blood	(dêmo)	I saw	moggete
Ten	(asiro)	Bone	saawuso	I know	ariho
Seed	yaro	Smoke	č'umo	Who is it?	kooni-ne
Hand	kiso	Stone	sut'o	Sheep	(bago)
Breast (f)	t'ano	Ashes	amedo	Goat	fennero
Tongue	(manaso)	Bark (tree)	gok'o	Donkey	kuro
Person	aso	Skin	gook'o	Horse	mač'o
Name	sigo	Peel bark!	Fuč'e	Woman	maačo
Small	gisêčo	Fat (meat)	k'oč'óó	Ensete	wuut'o
Big	ogo	Bite!	sač'	Teff	gaaso
Tooth	gaso	Dry	suuˀo	Barley	gea

Root	k'ombo	Eye	aafo	Wheat	teep'o
Red	č'ello	Cow	mimo	Boiled coffee	kačite
Sorghum	yaŋgo	Fly (bug)	yaamo	Rain	amió
Peas	aato	Grass	moč'o	Mountain	koró
Taro	bokino	Tail	č'ero	Nose	sit'o *
Potato	dok'k'o	White	(nêč'o)	Road	boočo
Forest yam	ajo	Moon	aasino	Snake	daammo
Black	aa$^{?}$o	Sun	aabo	Head	k'ello
Dog	kunaano	Star	? *	Man (vir)	annamo
Knee	gurtino	grass bedding	sifiro	Potter	(tumtu)
Claw	č'uŋgito	louse	č'uč'o	Bird	kafo
This, that	eebi	Far	woho	Hello!	(ašama)
He and she	toonnîni	Elder Brother	k'abbo	New	andiro
Earth	deč'o	Soil	sawo	All	ubbo
Thin	č'ič'o	Water	aač'o	Leaf	maato
Liver	k'amo	Long	genjo	Sleep!	kê-be
Sit!	yêbbêbê	Stand!	ti-be	Eat!	mame
Drink!	uye	Give!	îm-be	(It) burned	mič'č'ite
He died	k'itite	Hear!	sisite**	What?	amo
He said	getta bete	It got warm	k'eč'ite	Wild animal	č'oot'o
Buffalo	daŋgiyo$^{?}$ ***	Hyena	maaho	Milk	ejjo
Butter	k'efo	Cheek	mallalo	Urine	č'aakuro
Back, shoulder	gubbo				

* She cannot remember the word for 'star' but rejects regular Kafa's [t'ojjêno]. She also rejected regular Kafa's [muddo] for 'nose'.
** This probably means 'he heard'.
*** This is usually the word for 'elephant' in Kafa dialects.
There are noteworthy borrowings in TAJ' s corpus. All higher numbers were borrowed from Amharic, yet the lady herself spoke none of it. Also 'white', tongue', 'blood', and 'sheep' were from Amharic. One conclusion was that these borrowings had been in Bosha before TAJ's time; indeed a period of intense Amharic influence on the whole Gongan cluster is well-known. TAJ's two Oromo borrowings were on the other hand probably picked up by herself during her life.

In 1960 Herbert Lewis met a man named Abba Jirga, hereinafter AJ, who was a Fuga, a member of a despised group. However, Lewis and AJ were in Jiren (Jimma) which is Oromo country. 'Fuga' is not a regular Oromo term for any artisan caste group, usually despised. "Fuga' is peculiar to Janjero and Gurage country and the Fugas have been the subject of much historical speculation. Whence came such a caste group? Hence Lewis paid attention to AJ and halted his usual work for a spell to record AJ's language.

AJ said his mother and father were from Garo. He himself did not know how old he was. Old enough to have learned most of the language, yet young enough not to have forgotten it in Jimma. It was also likely that he had not been long separated from his parents, and probably his fellow Fugas, because his command of Bosha was pretty good.

Lewis gained a Swadesh list and some cultural vocabulary from Abba Jirga during the time he had to work with him. They are presented here :

One	ikko-ne	I drink	taˀusso	I'm okay	digoone assaččo
Two	gutto-ne	thou drinkest	neˀusse	Back	gubo
Three	hêjjo-ne	he drinks	biˀussi	Order to come	č'ege
Four	auddo	she drinks	biˀussa	He	nene (Dubious)
Five	uičo/uuičo	we drink	nuˀusso-hone	Sky	simao
Six	(siritto)	you drink	ussite-jajote	River	haačo
Seven	(sabato)	they drink	ussi	Darkness	t'ume-te
Eight	(simminto)	I drank	taˀussê	I went	ta-sae-te
Nine	(yiitio)	he drank	biˀussi-te	He went	bi-seˀe-te
Ten	(aasiro)	What is it?	biamone	Go!	ham-be
All	ubbe				
Ashes	amêddo	Hair	elo-ne	I	taane
Bark	bimatone	Hand	kiso / hiso	Thou	nene
Belly	maačo	Head	ello / illo-ne	We	ittoči-ne **
Big	oogo	Heart	(nibbo)		
Bird	kafo	Hot	êêčie	Seed	yaroso hone (?)
Bite!	saač'e	Knee	gurítino	Sleep!	k'eˀač'ine
Black	aˀo	Leaf	maato-ne	Sleep!	tokotâ-be
Blood	(damo)	Liver	tiroo-ne	Small	yiizêto
Bone	saauzo	Long	gânjo-ne	Smoke	č'umo
Breast (f)	t'ano	Louse	č'uč'o	Stand!	net'e-be
Claw	kiso iča	Man	annomo-ne	Stand!	let'e-be
Cold	k'orra	Meat	meno-/melo-ne	Stone	suut'o
Come!	wo-be	Moon	asino	Sun	aabo
He came	waa-te	Mountain	gêppo	Take, to	deˀe
Die!	k'it'i-be	Mouth	nono	That	ebie
Dog	kunaano	Name	sigo	This	ebine
Drink!	wiˀe / woiˀe	Thy name(?)	nê-sigo	That tree	ebi-mito-ne
Dry	suku-te	(?) Name	asi-sigo	This tree	mito-biamone
Ear	waamo	Neck	k'êt'o	Tree	mito / mit'o
Earth	deč'o	Night	woomio	Tongue	(manaso)
Eat!	mame	Nose	sit'o	Tooth	gaso
Egg	hank'ak'o *	Person	aso-ne	Water	haač'o
Eye	afo	Rain	amio-ne	What?	biamo
Fat (meat)	čomi-te	Rain, to	bučie	Who?	konine
Fire	k'ak'o	Red	č'ello	White	(naččo)
Fly, to	tii-te (= flew)	Road	boočo-ne	Woman	maačo
Foot	t'aamo / d'amo	Root	k'ombo-ne	Yellow	(nêč'č'o)
Give me!	ta-sâm-be	See!	moge		
Good	gawito-ne	Skin	gok'o-ne		

* Suspected of being from Oromo.** Suspected of being 'you-plural'. Kafa dialects usually have [no] or [noone] for 'we'.

Abba Jirga continued. Mainly cultural words:

Ensete food	huut'o	Iron	t'uro-ne
Coffee	buno-ne	War	êt'o-ne
Tobacco	tumbako	Spear	gino-ne
Corn (maize)	bok'olo	Sword	siko-ne
T'eff	gaaso	Knife	siko-ne
Horse	mâčo	King	tateno
Donkey	kuro	King's son	tateno buso
Cow	mimo	'Gofta' *	donoo-ne
Goat	fellero	Queen	gênne
God	yêrro	Ditch	boočo
House	keeto, heeto	Wasteland *	kubbo
Hamlet	ogetâ-keto	Drum	kambo
'Tumtu'	emmo	"Race", seed	yaro-nne
'Fak'i'	manno	Door	kello

* 'Gofta' is Oromo for 'lord' or 'chief' or 'respected person'. The Wasteland question was to translate the Oromo term [mogga]. In Shoan Oromo that means 'desert'. In Wallega Oromo it means 'empty, unoccupied' land.

It is striking that all their informants, who existed without their own linguistic community, also forgot the plural pronouns. Theoretically, of course, it is possible that AJ had changed the 'you' pronoun to 'we' deliberately, by himself. We suspect that disuse and neglect were more important reasons.

In future issues we will take on the *Yaaku* or *Mogogodo* of Kenya, the *Ngomvia* or *Qwadza* of Tanzania, and the strange case of inspired fakery in *Wag* or is it *Waag*? Our readers and colleagues are invited to poke around a little and send us some cases from the rest of the world. Is there one from deep in the Amazonian rain forest? Or the islands of Wickipeaa? We warn you! Some of these cases may be significant!

EXCURSUS

It is good to remember two things about long range taxonomy and reconstruction. First, one can easily see how much of human language and human culture disappears during our life times. For example, in Germany and America what were once thriving communities of Yiddish speakers, say in 1935, have disappeared almost completely. One can still find individual speakers but whole sections of cities or neighborhoods? No more. In Germany many speakers had simply been eradicated but in America what reason had there been? Many of the earlier speakers and their children were still alive but no longer using Yiddish, many words of which had passed into English. Soon Yiddish becomes Bosha, existing in a few heads only.Yet Hebrew arose from the dead! Second, We must remember that many many languages have disappeared over the millennia –all over the world. Taxonomies probably can not be complete or accurate for this reason. Third, consider this. We must record many before they vanish. Field work is badly needed yet few young scholars seem to care. Go forth and do your duty!

Book Notices

One Thing Leads to Another... : The Turbulent Youth of Dan McCall

by Daniel F. McCall

When his father's bankruptcy lands him, at age 9, in an orphanage in Springfield, Massachusetts, Dan McCall escapes to live in a hotel room with his dad, and of necessity to learn independence. He follows his natural curiosity about people into ceaseless adventures - exploring ethnically-mixed city streets, hitchhiking New England roads, hiking the Appalachian Trail, and enrolling in Depression-era summer military programs. Along the way, Dan discovers and nurtures his own deep love of learning; he haunts public libraries, engages teachers and school friends, and rebels against his Irish Catholic heritage. Lacking money for college, he rides the rails across country to harvest crops and falls in with a series of down-and-outers scrambling to make a living. He flirts with communism and socialism, and stays briefly on a farm with intellectuals creating their own institution of learning. Dan is ultimately caught up in World War II, where his experience as a hospital orderly places him in the South Pacific as a medic slated to go ashore in battle. This often-rollicking and always fascinating coming-of-age story, which ends as Dan enters college, is in the category of adventures too amazing to be fiction.

Daniel F. McCall was awarded his B.A. in history by Boston University in 1948, then went on to earn the Ph.D. in anthropology at Columbia University in 1956. He began teaching at Boston University in January of 1954 and retired from the African Studies Center there in 1983. Over the years he traveled, did research, and taught in many areas of the world, and is widely recognized for his expertise on West Africa, most particularly Ghana. He is perhaps best known for the classic *Africa in Time Perspective*.

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The Austronesian Languages (Pacific Linguistics, 602)

by Robert Blust

This is the first single-authored book that attempts to describe the Austronesian language family in its entirety. It includes chapters or chapter sections on: the physical and cultural background in which these languages are embedded, official and national languages, largest and smallest languages in all major geographical regions, speech levels and respect language, male/female speech differences, vituperation and profanity, secret languages, ritual languages, language contact, a survey of the sound systems of both typical and atypical languages in all major geographical regions, numerals and numeration, colour terminology, demonstratives, locatives and directions, pronouns, metaphor, language names and greetings, semantic change, lexical change, linguistics paleontology, morphology, syntax, the history of scholarship on Austronesian languages, a critical assessment of the reconstruction of Proto Austronesian phonology, a survey of types of sound change, a critical assessment of claims regarding the external relations of the Austronesian languages, subgrouping, size of the scholarly community and major centres of Austronesian scholarship, periodic meetings and periodic publications, landmarks of scholarship with regard to other language families, a survey of bibliographies of Austronesian linguistics, and an extensive list of references to the published literature.

Paperback: 824 pages

Publisher: Research School of Pacific and Asian Studies (2009)
ISBN-10: 0858836025 **ISBN-13:** 978-0858836020

Linguistic Fossils: Studies in Historical Linguistics and Paleolinguistics

by John D. Bengtson

The articles in this book represent a large part of Bengtson s work in historical linguistics and paleolinguistics over the past few years. The first two articles concern the worldwide picture of a human language family: global etymologies. The third is a brief summary of Bengtson's current view of the Austric macrofamily. The next six articles are concerned with the so called isolates, Basque and Burushaski, and Bengtson's view that they are just members of a larger macrofamily, Dene-Caucasian. The two essays with titles beginning "The Problem of Isolates ..." approach the issues in a narrative, minimally technical style, while the other four papers are more detail-oriented and technical. The last two articles concentrate on the Na-Dene family, which Bengtson considers an integral part of Dene-Caucasian. It hardly needs saying that much of the content of this book is out of the mainstream of historical linguistic work.

John D. Bengtson is an historical and anthropological linguist. He is a past president and currently a vice-president of the Association for the Study of Language in Prehistory, and has served as editor of the journal Mother Tongue (1996-2003 and 2007-). He is also a participant in the Evolution of Human Language Project, sponsored by Murray Gell-Mann and the Santa Fe Institute.

Paperback: 292 pages

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The Origins of the World's Mythologies

by E. J. Michael Witzel

This remarkable book is the most ambitious work on mythology since that of the renowned Mircea Eliade, who all but single-handedly invented the modern study of myth and religion. Focusing on the oldest available texts, buttressed by data from archeology, comparative linguistics and human population genetics, Michael Witzel reconstructs a single original African source for our collective myths, dating back some 100,000 years. Identifying features shared by this "Out of Africa" mythology and its northern Eurasian offshoots, Witzel suggests that these common myths – recounted by the communities of the "African Eve" – are the earliest evidence of ancient spirituality. Moreover these common features, Witzel shows, survive today in all major religions. Witzel's book is an intellectual hand grenade that will doubtless generate considerable excitement – and consternation – in the scholarly community. Indeed, everyone interested in mythology will want to grapple with Witzel's extraordinary hypothesis about the spirituality of our common ancestors, and to understand what it tells us about our modern cultures and the way they are linked at the deepest level.

E.J. Michael Witzel is Wales Professor of Sanskrit at Harvard University (1987), a Fellow of the American Academy of Arts and Sciences (2003), Honorary member of the German Oriental Society (2009), and President of the Association for the Study of Language in Prehistory (ASLIP, since 1995).

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